

Effluent Quality Assessment

Village of Tequesta Water Treatment Plant

Palm Beach County

NPDES #FL0168572

Sampled January 24, 2011

April 2011

Biology Section
Bureau of Laboratories
Division of Environmental Assessment and Restoration

Quality Manual No. 870346G
NELAC Certification No. E31780

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Village of Tequesta Water Treatment Plant (WTP), 901 N. Old Dixie Hwy., Tequesta, Palm Beach County, Florida, 33469. NPDES #FL0168572. Effluent grab samples for biological and chemical analyses for this facility were collected on January 24, 2011.

Introduction

Village of Tequesta WTP is a municipal drinking water facility which discharges Reverse Osmosis reject water into the Class III Marine waters of Jupiter Inlet. (See Appendix F for detailed facility information provided by Danielle Melnick of FDEP Southeast District.)

Methods

Samples were collected from the EFF-01 NPDES sampling point for Outfall D-001 by Terry Davis and Dan Krinsky (FDEP Southeast District) following DEP-SOP-001/01 FS 2400 Wastewater Sampling. All DEP SOPs are available on the web at: http://www.floridadep.org/labs/bars/sas/sop/index.htm.

See Appendix A for the completed chain of custody form.

The 48-hour acute screening toxicity tests and algal growth potential test were performed following internal DEP SOPs TA07_03, TA07_04, and TA08_01 through TA08_09. All internal DEP SOPs are available on the web at: http://www.floridadep.org/labs/cgi-bin/sop/biosop.asp.

Results and Discussion

- **Toxicity Test Results**
  Tests were performed January 25 - 27, 2011.

  Americamysis bahia 48-hour acute screening bioassay – LC_{50} > 100%, 25%* mortality in 100% sample at 48 hours

  Menidia beryllina 48-hour acute screening bioassay – LC_{50} > 100%, 0%* mortality in 100% sample at 48 hours

  The bioassay sample was acutely toxic (albeit low level) to the *Americamysis bahia* test species.

  The chemistry results confirmed that the ion makeup of the sample was not in seawater proportions and that the apparent 18.9‰ salinity of the sample was due to elevated levels of ground-water ions. The observed mortality in the *A. bahia* test is likely due to the seawater-ion imbalance of the sample. Previous research conducted by the FDEP Biology Section demonstrated that *A. bahia* is much more sensitive to seawater-ion imbalances than is *M. beryllina* (FDEP. 1995). The calcium concentration was measured at 708 mg/L at 18.9‰ salinity (salinity based on conductivity and temperature). This is approximately three times (3X) the nominal concentration (226 mg/L) for calcium in seawater of this salinity. The magnesium concentration was measured at 745 mg/L at 18.9‰ salinity. This is slightly more than the nominal concentration (693.4 mg/L) for magnesium in seawater of this salinity. The elevated calcium concentration is one source of toxicity in this sample, but other unidentified sources of toxicity cannot be ruled out without performing the major-seawater-ion imbalance toxicity testing protocols cited above.

  *NOTE: In a 48-hour acute screening test of 100% effluent, mortality of <20% provides confidence that the effluent meets the acute toxicity criterion of Florida's Surface Water Quality Standards (Rule 62-302.500 (1) (a) 4, F.A.C.). Mortality between 20-50% indicates low to moderate levels of toxicity, and further action may be required. Mortality of >50% indicates that the effluent fails to meet the minimum requirement to discharge to waters of the state (Rule 62-4.244(3) (a), F.A.C.).

See Appendix B for bioassay bench sheets. See Appendix C for results of the last 20 standard reference toxicant (SRT) tests and the bench sheets and statistical analyses of the SRT tests that correspond to these facility tests. See Appendix D for test organism receipts.

- **Algal Growth Potential**
  The effluent Algal Growth Potential (AGP) was 3.0 AU (A - Value reported is the mean of two or more determinations, U - Material was analyzed for but not detected; the value reported is the minimum detection limit) mg dry wt/L of the saltwater species *Dunaliella tertiolecta.* Raschke and Schultz determined that AGP values above 10.0 mg dry weight/L represent a “problem” threshold for marine receiving waters, implying nutrient enrichment (personal communication, Marshall Faircloth, et. al. FDEP, with Ron Raschke USEPA Region 4 1987). The ratios of total nitrogen to total phosphorus and inorganic nitrogen to orthophosphate (55.8:1 and 184.1:1, respectively) suggest that the effluent is limited by phosphorus (Maloney et al. 1978).

  See Table 1 for AGP results.

- **Chemistry Results**
  Total residual chlorine was not detected in the bioassay sample in the laboratory. Total ammonia was detected in the bioassay sample in the laboratory at a concentration of 2.34 mg N /L. The total ammonia concentration in the composite sample collected and preserved for chemical analysis was 4.4 mg N /L. Based on the pH, salinity, and temperature of the effluent as collected, the calculated unionized ammonia concentration was ≤ 0.02 mg/L.

  Radium (226 + 228) was detected in the effluent at levels that comply with permit conditions, but exceed Class III marine water quality criteria (62-302.530 (57) (a) F.A.C.). Aluminum, arsenic, and Total Suspended Solids (TSS) were detected between the laboratory method detection limits (MDL) and practical quantitation limits (PQL). Chlorophyll *a* was not detected in the effluent. Effluent pH (5.97 SU; limit 6.5-8.5 SU, 62-302.500 (51) (c), F.A.C. and permit # FL0168572) was less than both Class III marine criteria and permit conditions. Due to the alpha-counting error rate (17.8 pCi/L) it cannot be determined if effluent total alpha (31.6 pCi/L) exceeded the Class III criterion of ≤ 15.0 pCi/L (62-302.500 (57) (b), F.A.C.).

  See Table 2 for results of analytes detected in the effluent, and corresponding limits. See Appendix E for a complete list of chemical analyses performed. See Appendix B for bioassay lab equipment.

Conclusion

The effluent sample collected from the EFF-01 for this facility on January 24, 2011, exhibited low level acute toxicity to the *Americamysis bahia* test species during the 48-hour acute screening bioassays, but did not exceed the permitted limit of LC_{50} ≥ 25% effluent. The cause of toxicity was attributed, at least in part, to the seawater-ion imbalance within the sample. The effluent AGP result was less than the "problem” threshold for marine receiving waters. Effluent pH (5.97 SU; limit 6.5-8.5 SU, 62-302.500 (51) (c), F.AC. and permit # FL0168572) was lower than (exceeded) both Class III marine criteria and permit conditions. Radium (226 + 228) was detected in the effluent at levels that comply with permit conditions but exceed Class III marine water quality criteria (62-302.530 (57) (a), F.A.C.). Due to the alpha-counting error rate (17.8 pCi/L) it cannot be determined if effluent total alpha (31.6 pCi/L) exceeded the Class III criterion of ≤ 15.0 pCi/L (62-302.500 (57) (b), F.A.C.). Other effluent water quality samples collected on January 24, 2011 were within applicable water quality standards and did not violate permit conditions.

Literature Cited

Maloney, T. E., W. E. Miller, and D. T. Specht. 1974. The Marine Algal Assay Procedure: Bottle Test. National Environmental Research Center Office of Research and Development. U. S. EPA, Corvallis, Oregon. 43 p.

FDEP. 1995. Protocols for determining Major-Seawater-Ion Toxicity in Membrane-Technology Water-Treatment Concentrate. Biology and Chemistry Section, FDEP Bureau of Laboratories, Tallahassee, Florida. 99 pp.

Table 1. Measured algal growth potential (AGP; mg dry weight/L) of the saltwater species *Dunaliella tertiolecta* and ratios of nitrogen to phosphorus for samples collected from the Village of Tequesta Water Treatment Plant on January 24, 2011.

Village of Tequesta WTP NPDES# FL0168572				
Location	AGP (measured)		Inorganic N:P ratio	Total N:P ratio
Effluent	3.0	AU	184.1	55.8

A - Value reported is the mean of two or more determinations

U - Material analyzed for but not detected; value reported is the method detection limit

Table 2. Effluent limits, Class III Criteria for predominantly marine waters and chemical data for samples collected from the Village of Tequesta Water Treatment Plant on January 24, 2011.

Village of Tequesta WTP NPDES# FL0168572	Class III Criteria	Effluent Limits	Effluent	
Metals (µg/L unless otherwise noted)				
Aluminum	≤ 1500	-	180	I
Arsenic	≤ 50	-	1.6	I
Cadmium	≤ 8.8	-	0.15	U
Calcium (mg/L)	-	-	708	
Chromium-III	-	-	0.9	U
Copper	≤ 3.7	Report	1.5	U
Iron	≤ 300	-	30	U
Lead	≤ 8.5	-	0.6	U
Magnesium (mg/L)	-	-	745	
Nickel	≤ 8.3	-	0.75	U
Selenium	≤ 71	-	0.6	U
Silver	≤ 2.3	-	0.075	U
Zinc	≤ 86	-	15	U
Nutrients (mg/L)				
Ortho-phosphate	-	-	0.029	
Total Phosphorus	-	-	0.11	
Total Ammonia	-	Report	4.4	
Un-ionized Ammonia	-	-	≤ 0.02	c
Nitrate and Nitrite	-	-	0.94	
Total Kjeldahl Nitrogen	-	-	5.2	
Organic Nitrogen	-	-	0.8	c
Total Nitrogen	-	Report	6.14	c
General Physical and Chemical Parameters				
Dissolved Oxygen (mg/L)	≥ 4.0	≥ 1.5 s	7.2	£
pH (SU)	6.5 - 8.5	6.5 - 8.5 s	5.97	
Conductivity (µmhos/cm)	-	Report	29480	
Temperature (°C)	-	Report	23.3	
Salinity	-	Report	18.9	c
Total Residual Chlorine (mg/L)	≤ 0.01	-	≤ 0.03	Q£
Total Suspended Solids (mg/L)	-	-	8	I
Chlorophyll *a* (µg/L) - Corrected	-	Report	0.55	U
Phaeophytin (µg/L)	-	-	0.4	U
Fluoride (mg/L)	≤ 5.0	≤ 5.0 s	2.7	
Alpha, Total (pCi/L)	≤ 15.0	≤ 124.7 s	31.6 ± 17.1	
Alpha-Counting Error (pCi/L)	-	-	17.1	
Radium 226 (pCi/L)	-	-	17.8	
Radium 226-Counting Error (pCi/L)	-	-	0.7	
Radium 228 (pCi/L)	-	-	0.8	U
Radium 228-Counting Error (pCi/L)	-	-	0.5	
Radium 226 + 228 (pCi/L)	≤ 5	≤ 55.4 s	17.8	c
Toxicity (LC50 %)	-	≥ 25 p	> 100	
Flow (MGD)	-	1.3 a	-	*
Hardness (mg $CaCO_3$)	-	-	4835.79	c

Value exceeds the Class III Water Quality Criteria or permit limits

a - Annual average
c - Value is calculated
p - Composite sample
s - Single sample
I - The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit
Q - Sample held beyond normal holding time
U - Material analyzed for but not detected; value reported is the method detection limit
£ - measurement taken in the FDEP laboratory
* - No flow monitoring required by permit

Florida Department of Environmental Protection

Central Laboratory Sample Submittal Form

Event ID *

Request Number: RQ-2011-01-24-17
FYI3 for Village of Tequesta RO

Requester: Cari Butler

Field Report Prepared By: T. Davis

Customer: SE-DIST
Project ID: FYI3
PMAS: 1143

Collected By: T. Davis / D. Krenskey

Sampling Agency: Southeast District

Send Final Report To: Michael Hambor/Terry Davis

Lab ID *	Location	Comp / Grab	Collection (begin) Date Time Eastern Central	Collection (end) Date Time Eastern Central	Bottle Group(s)**
	Field ID: 51-VT-1		Tot Res Chlorine (mg/L)	Diss Oxygen ~~(mg/L)~~: 6.6 %	Storet Station Number
	Matrix (include type e.g. Salt, Fresh, etc): R.O. reject	Temp (C): 23.25	pH: 5.97	Sample Depth: .01 ft	Salinity (PPTh) / Sp Conductance (umho/cm): 29,480	NPDES Number	A
	Latitude dd dms	Longitude dd dms	Comments: 1 Biology Bottle in Tote by J.D. 10:20 1.25.11		

Lab ID *	Location: Blank	Comp / Grab	Collection (begin) Date: 1/24/11 Time: 1105 Eastern Central	Collection (end) Date Time Eastern Central	Bottle Group(s)**
	Field ID: 51-VT-2		Tot Res Chlorine (mg/L)	Diss Oxygen (mg/L)	Storet Station Number	B
	Matrix (include type e.g. Salt, Fresh, etc): d.i. water	Temp (C)	pH	Sample Depth: .01 ft	Salinity (PPTh) / Sp Conductance (umho/cm)	NPDES Number	
	Latitude dd dms	Longitude dd dms	Comments		

Lab ID *	Location	Comp / Grab	Collection (begin) Date Time Eastern Central	Collection (end) Date Time Eastern Central	Bottle Group(s)**
	Field ID		Tot Res Chlorine (mg/L)	Diss Oxygen (mg/L)	Storet Station Number	
	Matrix (include type e.g. Salt, Fresh, etc)	Temp (C)	pH	Sample Depth m ft	Salinity (PPTh) / Sp Conductance (umho/cm)	NPDES Number	
	Latitude dd dms	Longitude dd dms	Comments		

Lab ID *	Location	Comp / Grab	Collection (begin) Date Time Eastern Central	Collection (end) Date Time Eastern Central	Bottle Group(s)**
	Field ID		Tot Res Chlorine (mg/L)	Diss Oxygen (mg/L)	Storet Station Number	
	Matrix (include type e.g. Salt, Fresh, etc)	Temp (C)	pH	Sample Depth m ft	Salinity (PPTh) / Sp Conductance (umho/cm)	NPDES Number	
	Latitude dd dms	Longitude dd dms	Comments		

Relinquished By:	Date/Time	Shipping Method:	Received By:	Date/Time	Relinquished By:	Date/Time	Received By:	Date/Time
[signature]	1/24-1400	Fedex	[signature]	1-25-11 09:55				

* Shaded Areas for Lab use only.

** Please see reverse side for Bottle Group information.

last revised October 1, 2003

FDEP Biology Laboratory - Acute Bioassay Bench Sheets

Facility: Village of Tequesta Water Treatment Plant
Address : 901 North old Dixie Highway
City: Tequesta **County:** Palm Beach
Contact/District: Danielle Melnick/Southeast
NPDES Permit #: FL 0168572
LIMS Job #: FLH-2011-01-25-37 (MF)
LIMS Sample #: 1326039
Lims Data Entry: 1-28-11 MF
Data Entry Verification: ~~1-28-11~~ JD 1.28.11

Sample Collection: Date: 1-24-2011 Time: 1050
Hold Time Start: Date: 1-24-2011 Time: 1050

Comments:

Initial sample handling:
Instructions: Check yes or no. If yes is checked, complete blanks

PH adjustment : ☐ yes ☑ no Initial pH: ____ NaOH ____ N HCl ____ N ____ Drops mL Final pH: ____
Aeration : ☐ yes ☑ no Initial DO: ____mg/L Final DO: ____mg/L Duration: ____minutes Rate: ~ ____bubbles/min
Salinity adjusted (Test 1): ☐ yes ☑ no Initial Salinity: ____ Final Salinity: ____ Salts Hypersaline brine
Salinity adjusted (Test 2): ☐ yes ☑ no Initial Salinity: ____ Final Salinity: ____ Salts Hypersaline brine
Dechlorination: ☐ yes ☒ no ____mL of 0.025N Sodium Thiosulfate per liter of sample. Final TRC: ____

Sample Validation:
Instructions: Check yes or no. Fill in temperatures.

Temperature: Shipped ≤ 6°C ☑ Yes ☐ No — IF Hand Delivered: Cooling ☐ Yes ☐ No (received ____°C collected____°C)
Holding Time: ≤ 36 Hours ☑ Yes ☐ No (Composite-end of collection; grab-when collected; 4 in 24 - time last sample collected)

Investigators' Signatures:	Initials:
Kara Cox	KC
Marshall Faircloth	MF
Jane Smith (MF)	JD
Brent Alfonso	BA
Amelia Rankin	AR
REVIEWER: Liz Miller	

Diluent/Control Batch#:				01.03.11	01.03.11				
Water Quality Parameters	20% DMW	Well Water	Moderately Hard Water	Salt Water (ASW) NSW Test 1	Salt Water (ASW) NSW Test 2	Other:	Original Sample	Measured by	Verified by
Field Total Residual Cl_2 (mg/L):	N/A	N/A	N/A	N/A	N/A	N/A	not measured		KC
Lab Total Residual Cl_2 (mg/L):				<0.03	<0.03		<0.03	AR/JD	KC
Alkalinity (mg/L as $CaCO_3$):				200	200		199	KC	KC
Hardness (mg/L as $CaCO_3$):				—	—		—	—	—
Total Ammonia (mg/L as N):				<0.034	<0.034		2.34	MF	KC
Conductivity: ☐ µmhos ☑ mmhos				30.9	30.7		30.1o	KC	KC
Salinity (ppth):				18.9	18.9		18.9	JD	KC

V 1.0 1/13/10

Appendix B. (continued)

[redacted]

FDEP Biology Laboratory - Bioassay Survival Bench Sheet

LIMS Sample # 1326039 **SOP#: TA 07-**0X3 (mt) **Test #** 1 **of** 2

Test Species:
Batch #: 1.25.11 Age: 5 days
- ☐ *Ceriodaphnia dubia*
- ☐ *Cyprinella leedsi*
- ☐ *Pimephales promelas*
- ☐ *Menidia beryllina*
- ☑ *Americamysis bahia*
- ☐ Other:______

Test Validation
Control Survival ≥ 90%: ☑ Yes ☐ No
Temperature Range ≤ 3° C: ☑ Yes ☐ No

Diluent (Batch # 1.03.11 **)**
☑ ASW ☐ 20% DMW
☐ MHW ☐ Well

Test Type: ☑ Acute ☐ Definitive
☑ Static ☐ Static Renewal ☐ Flow-Through

Test Duration:
☑ 48 hr
☐ 96 hr
☐ __hr

Chamber Size 1000 **ml**
Test Volume: 400 **ml**

Test Started:
Date 1.25.11 Time 1300

Test Ended:
Date 1.27.11 Time 1500

Concentration	Replicate	Chamber #	Test Hour: 0 hr	24 hr	48 hr BR	48 hr AR	72 hr	96 hr
Ctrl.	A	#13	5	5	5			
	B	# 14	5	5	5			
	C	# 15	5	5	5			
	D	# 16	5	5	5			
100%	A	# 17	5	5	4 1D			
	B	# 18	5	5	5			
	C	# 19	5	5	4 1D			
	D	# 20	5	5	2 3D			
Checked or Verified by:			JD	JD	JD			

Loaded/ Verified by: JD / KC

m = missing, d = dead, BR/AR Before/ After Renewal

Food
- ☐ YCT Batch#______
- ☐ P. subcapitata Batch#______
- ☑ Artemia Lot# 23613

Feeding and Artemia Batch #
- ☒ 0 hr 3-11
- ☒ 24 hr 4-11
- ☐ 48 hr____
- ☐ 72 hr____

☒ Prior to Test
☒ Prior to Renewal (KC)

Temperature Range (°C)

Incubator # 2
min. 27.0 max. 27.8 mean —

Incubator #___
min._____ max._____ mean_____

Waterbath #___
min._____ max._____ mean_____

Room B246
min. 25.0 max. 25.9 mean —

Light intensity (ft. candles): 50-100

Photoperiod (hours): 16 light, 8 dark

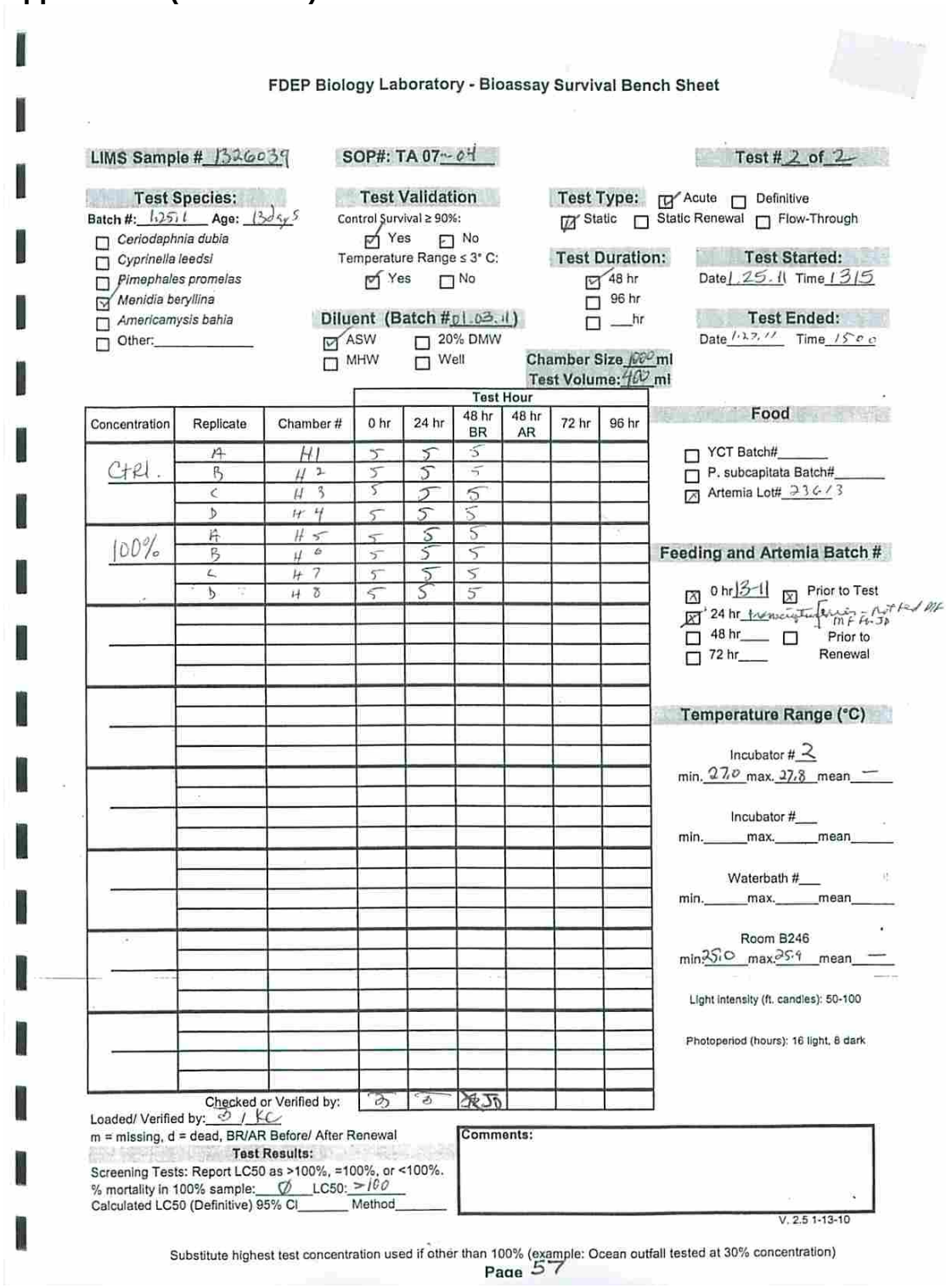
Test Results:
Screening Tests: Report LC50 as >100%, =100%, or <100%.
% mortality in 100% sample: 25% LC50: >100%
Calculated LC50 (Definitive) 95% CI______ Method______

Comments:

V. 2.5 1-13-10

Substitute highest test concentration used if other than 100% (example: Ocean outfall tested at 30% concentration)

Appendix B. (continued)



FDEP Biology Laboratory - Bioassay Survival Bench Sheet

LIMS Sample # 1326039 SOP#: TA 07-04 Test # 2 of 2

Test Species:
Batch #: 1.25.11 Age: 13 days
- ☐ *Ceriodaphnia dubia*
- ☐ *Cyprinella leedsi*
- ☐ *Pimephales promelas*
- ☑ *Menidia beryllina*
- ☐ *Americamysis bahia*
- ☐ Other:_____

Test Validation
Control Survival ≥ 90%: ☑ Yes ☐ No
Temperature Range ≤ 3° C: ☑ Yes ☐ No

Diluent (Batch #01.03.11)
☑ ASW ☐ 20% DMW ☐ MHW ☐ Well

Test Type: ☑ Acute ☐ Definitive ☑ Static ☐ Static Renewal ☐ Flow-Through

Test Duration: ☑ 48 hr ☐ 96 hr ☐ ___hr

Test Started: Date 1.25.11 Time 1315

Test Ended: Date 1.27.11 Time 1500

Chamber Size 1000 ml
Test Volume: 400 ml

Concentration	Replicate	Chamber #	Test Hour 0 hr	24 hr	48 hr BR	48 hr AR	72 hr	96 hr
Ctrl.	A	H1	5	5	5			
	B	H 2	5	5	5			
	C	H 3	5	5	5			
	D	H 4	5	5	5			
100%	A	H 5	5	5	5			
	B	H 6	5	5	5			
	C	H 7	5	5	5			
	D	H 8	5	5	5			
Checked or Verified by:			JD	JD	JR JD			

Loaded/ Verified by: JD / KC
m = missing, d = dead, BR/AR Before/ After Renewal

Test Results:
Screening Tests: Report LC50 as >100%, =100%, or <100%.
% mortality in 100% sample: 0 LC50: >100
Calculated LC50 (Definitive) 95% CI_____ Method_____

Food
- ☐ YCT Batch#_____
- ☐ P. subcapitata Batch#_____
- ☒ Artemia Lot# 23613

Feeding and Artemia Batch #
- ☒ 0 hr 13-11 ☒ Prior to Test
- ☒ 24 hr transcription error - fed M F Fr. JD
- ☐ 48 hr___ ☐ Prior to Renewal
- ☐ 72 hr___

Temperature Range (°C)
Incubator # 2
min. 27.0 max. 27.8 mean —
Incubator #___
min.____max.____mean____
Waterbath #___
min.____max.____mean____
Room B246
min. 25.0 max. 25.9 mean —
Light intensity (ft. candles): 50-100
Photoperiod (hours): 16 light, 8 dark

Comments:

V. 2.5 1-13-10

Substitute highest test concentration used if other than 100% (example: Ocean outfall tested at 30% concentration)
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Appendix B. (continued)

FDEP Biology Laboratory - Bioassay Parameter Sheet

LIMS Sample # 13260039 Test # 1 of 2

Test Species:

☐ *Ceriodaphnia dubia* ☐ *Pimephales promelas* ☑ *Americamysis bahia*
☐ *Cyprinella leedsi* ☐ *Menidia beryllina* ☐ Other:_____

Test aerated: (if DO is < 4.0 mg/L) ☐ Yes ☒ No

Concentration	Replicate	Test Hour	pH (SU)	Temperature (°C)	Dissolved Oxygen (mg/L)	Conductivity ☐ µmhos ☒ mmhos	Salinity* (ppth)
Ctrl.	A	0 hr	8.2	24.3	7.8 7.2	30.9	18.9
	B	24 hr	8.1	24.4	6.7	31.7	19.7
	C	48 hr BR	8.0	24.1	6.8	32.2	20.0
		48 hr AR					
		72 hr					
		96 hr					
100%	A	0 hr	6.8	25.9	6.9 6.1	30.6	18.9
	B	24 hr	7.6	24.4	6.9	31.3	19.5
	C	48 hr BR	8.0	24.3	7.0	31.8	19.8
		48 hr AR					
		72 hr					
		96 hr					
		0 hr					
		24 hr					
		48 hr BR					
		48 hr AR					
		72 hr					
		96 hr					
		0 hr					
		24 hr					
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		72 hr					
		96 hr					
		0 hr					
		24 hr					
		48 hr BR					
		48 hr AR					
		72 hr					
		96 hr					
		0 hr					
		24 hr					
		48 hr BR					
		48 hr AR					
		72 hr					
		96 hr					

*Measure/ record salinity for marine tests

Comments:

Measured By:
0 hr: JD / KC
24 hr: JD
48 hr BR: JD
48 hr AR:
72 hr:
96 hr:

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V. 2.3 1-13-10

Appendix B. (continued)

LIMS Sample # 1326039

FDEP Biology Laboratory - Bioassay Parameter Sheet

Test # 2 of 2

Test Species:

☐ *Ceriodaphnia dubia* ☐ *Pimephales promelas* ☐ *Americamysis bahia*
☐ *Cyprinella leedsi* ☑ *Menidia beryllina* ☐ Other:_____

Test aerated: (if DO is < 4.0 mg/L)
☐ Yes ☑ No

Concentration	Replicate	Test Hour	pH (SU)	Temperature (°C)	Dissolved Oxygen (mg/L)	Conductivity ☐ µmhos ☑ mmhos	Salinity* (ppth)
Ctrl.	A	0 hr	8.2	24.2	~~7.9~~ 7.1	30.7	18.9
	B	24 hr	8.1	24.6	6.8	31.3	19.6
	C	48 hr BR	8.1	24.4	6.9	32.3	20.4
		48 hr AR					
		72 hr					
		96 hr					
100%	A	0 hr	6.9	25.9	~~6.6~~ 6.2	30.6	19.0
	B	24 hr	7.7	24.5	6.5	31.1	19.3
	C	48 hr BR	8.0	24.5	7.4	32.1	20.0
		48 hr AR					
		72 hr					
		96 hr					
		0 hr					
		24 hr					
		48 hr BR					
		48 hr AR					
		72 hr					
		96 hr					
		0 hr					
		24 hr					
		48 hr BR					
		48 hr AR					
		72 hr					
		96 hr					
		0 hr					
		24 hr					
		48 hr BR					
		48 hr AR					
		72 hr					
		96 hr					
		0 hr					
		24 hr					
		48 hr BR					
		48 hr AR					
		72 hr					
		96 hr					
		0 hr					
		24 hr					
		48 hr BR					
		48 hr AR					
		72 hr					
		96 hr					
		0 hr					
		24 hr					
		48 hr BR					
		48 hr AR					
		72 hr					
		96 hr					

*Measure/ record salinity for marine tests

Comments:

Measured By:
0 hr: JD/KC
24 hr: JD
48 hr BR: JD
48 hr AR:
72 hr:
96 hr:

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V. 2.3 1-13-10

Appendix B. (continued)

Test ID: V. Hoyt Bioassay Dates: Jan 25-27, 2012

METER / DEVICE	ID	SOP	Parameter	Method	v used
YSI Model 58 Dissolved Oxygen Meter	90H018262	TA06_04	Dissolved Oxygen	SM 4500 O G	√
YSI DO Probe	5905	TA06_04	Dissolved Oxygen	SM 4500 O G	√
Accumet AR-10 pH Meter	93312105	TA06_23	pH	SM 4500 H+	√
Mettler-Toledo SevenMulti Conductivity Meter	SN 1225117049 Probe H04257	TA06_25	Conductivity Salinity	SM 2510 B SM 2520 B	√
Denver Model 225 ISE with ammonia probe	SN K01377	TA06_17	Ammonia	SM 4500 NH3 F	MF
Traceable Thermometer	#1-SN101686412 #2-SN221295527 #3-SN240116020 #4-SN80361795 #5 SN61990624	TA06_05	Temperature	SM-2530B modified DEP SOP-001/01 FT1400	Ec #5
Hach Pocket Colorimeter II	05050C026378	TA06_22	Total Residual Chlorine	EPA 330.5 SM 4500 CL G	√
Alkalinity (Hach Kit)	No SN	TA06_08	Alkalinity	SM 2320 B	√
Hardness (Hach Kit)	No SN	TA06_09	Hardness	SM 2340 C	—
OHAUS Balance 250D	1125481084	TA06_21 TA06_27	Weight	-	
S-Weights	BIO-S-WEIGHTS-01	NA	Balance check	-	

SM-2530B modified to allow use of electronic and non-mercury filled thermometers.

Insert other device information in blank spaces(if used). Test ID = Facility or SRTs (acute SRT--Chronic SRT)

MF 3-2-12

V 1.1 9/21/10 MF/jd

B60

Appendix C. SRT Bench Sheets and Statistical Analysis

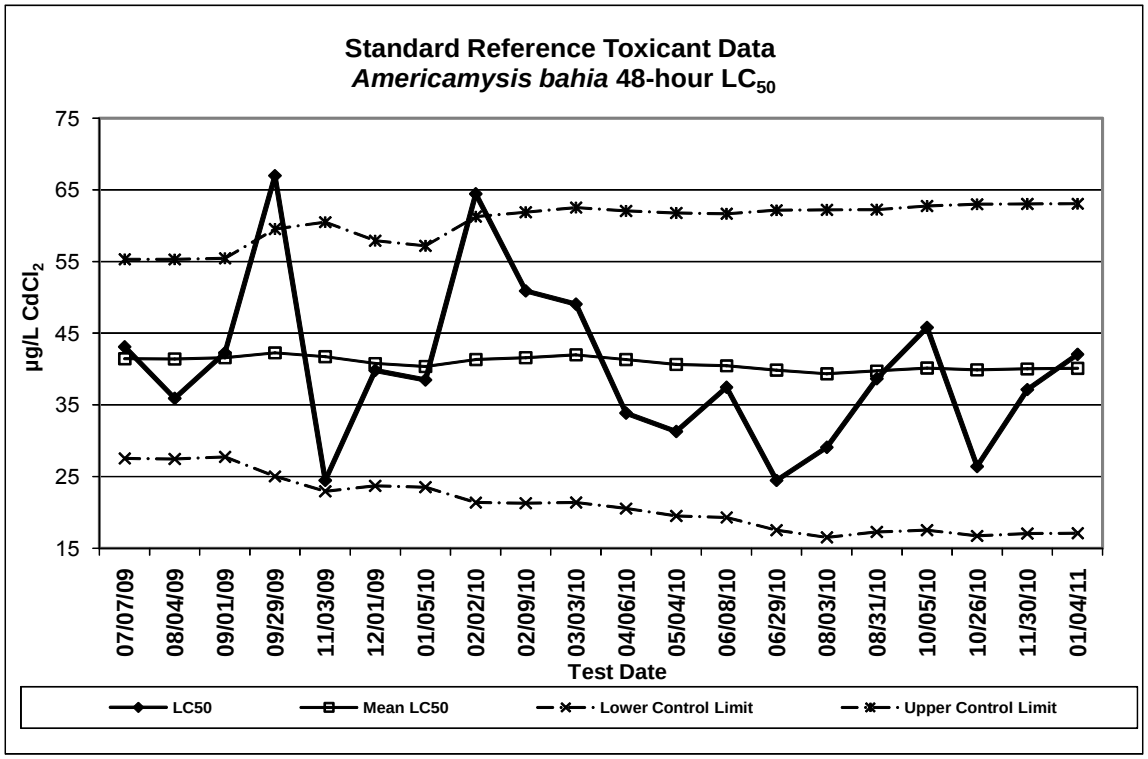
Florida Department of Environmental Protection
Bureau of Laboratories

Standard Reference Toxicant (SRT) Test Data - 48-hour Acute Toxicity
Americamysis bahia (mysid shrimp) - Cadmium Chloride ($CdCl_2$)

Date	LC50	Mean LC50	Std Dev	Lower Control Limit	Upper Control Limit
07/07/09	43.11	41.44	6.94	27.55	55.32
08/04/09	35.91	41.41	6.97	27.47	55.34
09/01/09	42.29	41.61	6.93	27.76	55.46
09/29/09	67.01	42.30	8.62	25.06	59.54
11/03/09	24.49	41.74	9.40	22.94	60.54
12/01/09	39.81	40.82	8.56	23.70	57.93
01/05/10	38.48	40.36	8.42	23.53	57.19
02/02/10	64.45	41.35	9.97	21.41	61.28
02/09/10	50.93	41.59	10.15	21.30	61.89
03/03/10	49.07	41.98	10.29	21.40	62.55
04/06/10	33.86	41.33	10.37	20.58	62.08
05/04/10	31.29	40.65	10.57	19.51	61.79
06/08/10	37.47	40.49	10.60	19.30	61.69
06/29/10	24.49	39.86	11.17	17.52	62.20
08/03/10	29.10	39.36	11.43	16.51	62.21
08/31/10	38.67	39.77	11.24	17.28	62.25
10/05/10	45.81	40.15	11.31	17.52	62.77
10/26/10	26.43	39.90	11.57	16.76	63.03
11/30/10	37.16	40.06	11.50	17.06	63.06
01/04/11	42.07	40.10	11.50	17.09	63.10

Lower Confidence Limit = mean - 2 * Std Dev
Upper Confidence Limit = mean + 2 * Std Dev

CV = 28.69
EPA reference 75th quartile CV = 26%



Appendix C. (continued)

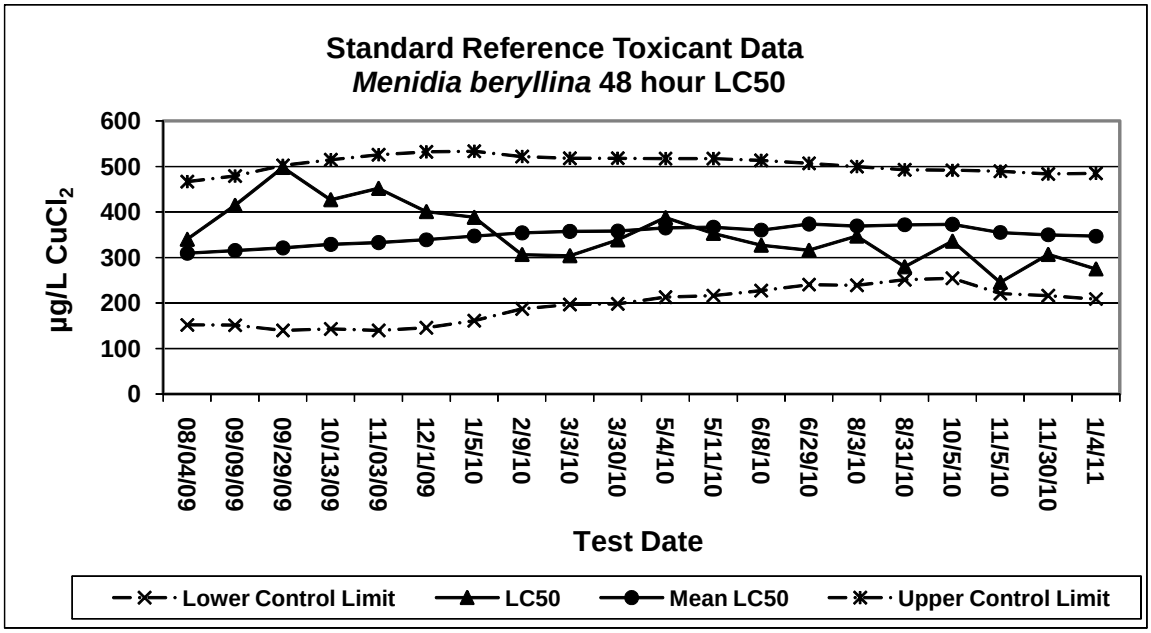
Florida Department of Environmental Protection
Bureau of Laboratories

Standard Reference Toxicant (SRT) Test Data - Acute Toxicity
Menidia beryllina (Inland silverside) - Copper Chloride ($CuCl_2$)

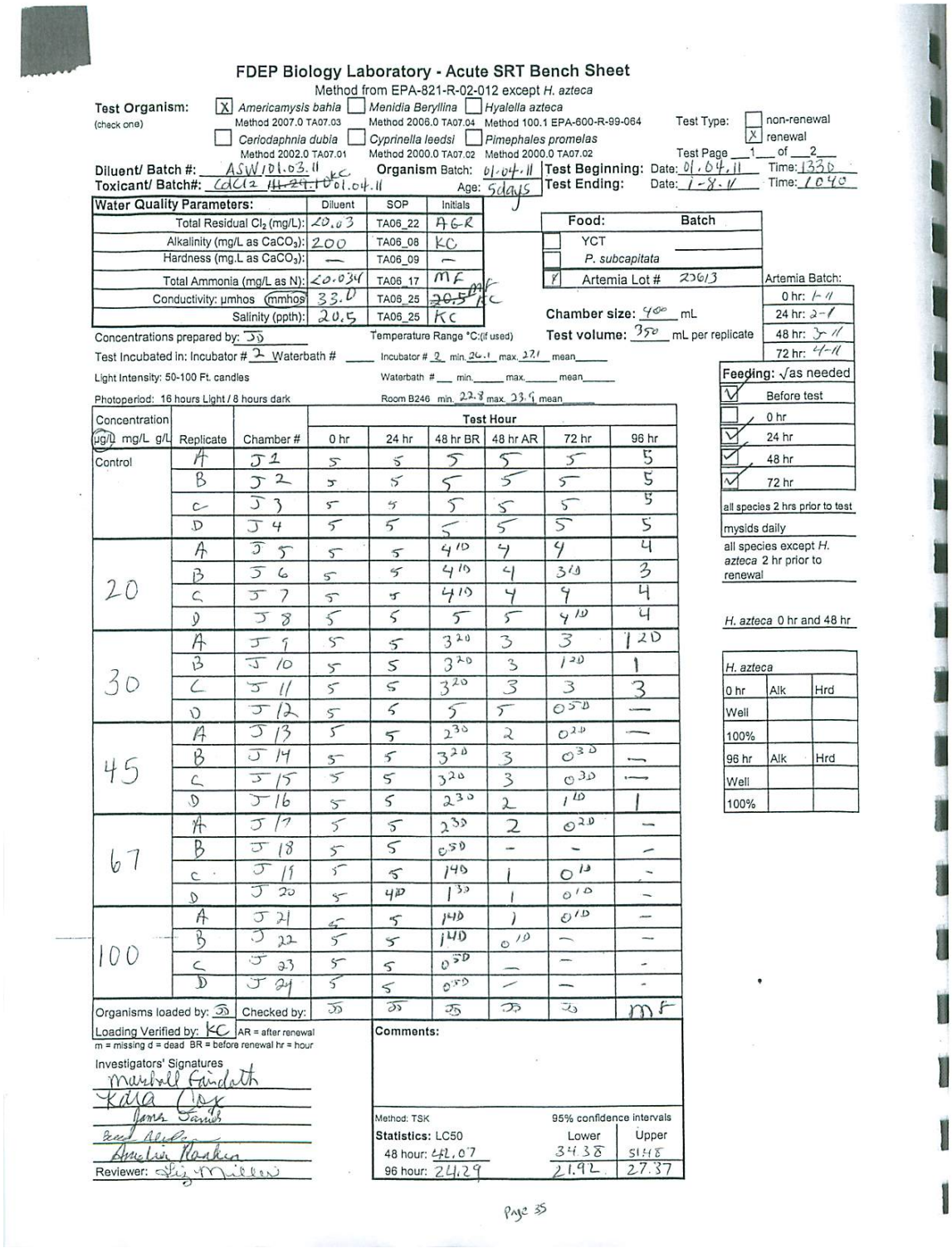
Date	LC50	Mean LC50	Std Dev	Lower Control Limit	Upper Control Limit
08/04/09	339.47	309.04	78.65	151.74	466.34
09/09/09	414.01	314.96	81.97	151.03	478.90
09/29/09	497.50	320.86	90.65	139.57	502.16
10/13/09	426.50	328.56	92.84	142.89	514.24
11/03/09	451.45	332.46	96.39	139.68	525.25
12/1/09	400.34	338.72	96.54	145.64	531.80
1/5/10	387.88	347.06	92.99	161.08	533.03
2/9/10	306.10	353.99	83.59	186.81	521.16
3/3/10	303.50	357.16	80.17	196.82	517.50
3/30/10	338.23	357.79	79.96	197.88	517.71
5/4/10	387.23	364.66	76.00	212.67	516.66
5/11/10	352.66	366.46	75.23	216.00	516.91
6/8/10	326.64	359.94	71.41	227.11	512.76
6/29/10	315.29	373.43	66.55	240.32	506.53
8/3/10	346.64	369.06	65.22	238.62	499.50
8/31/10	279.08	371.57	60.33	250.90	492.23
10/5/10	335.32	372.83	59.23	254.36	491.30
11/5/10	244.95	354.74	67.21	220.32	489.16
11/30/10	306.25	349.69	66.85	215.99	483.40
1/4/11	274.39	346.44	68.93	208.58	484.30

Means are of the last 20 SRT tests.

EPA reference 75th quartile CV = 21% **CV = 19.90**



Appendix C. (continued)



FDEP Biology Laboratory - Acute SRT Bench Sheet

Method from EPA-821-R-02-012 except *H. azteca*

Test Organism: (check one) [X] *Americamysis bahia* Method 2007.0 TA07.03; [ ] *Menidia Beryllina* Method 2006.0 TA07.04; [ ] *Hyalella azteca* Method 100.1 EPA-600-R-99-064; [ ] *Ceriodaphnia dubia* Method 2002.0 TA07.01; [ ] *Cyprinella leedsi* Method 2000.0 TA07.02; [ ] *Pimephales promelas* Method 2000.0 TA07.02

Test Type: [ ] non-renewal [X] renewal

Test Page 1 of 2

Diluent/ Batch #: ASW101.03.11 KC

Toxicant/ Batch#: CdCl2 ~~11.29.10~~ 01.04.11

Organism Batch: 01.04.11 Age: 5days

Test Beginning: Date: 01.04.11 Time: 1330

Test Ending: Date: 1-8-11 Time: 1040

Water Quality Parameters:	Diluent	SOP	Initials
Total Residual Cl_2 (mg/L):	<0.03	TA06_22	AGR
Alkalinity (mg/L as $CaCO_3$):	200	TA06_08	KC
Hardness (mg.L as $CaCO_3$):	—	TA06_09	—
Total Ammonia (mg/L as N):	<0.034	TA06_17	MF
Conductivity: µmhos (mmhos)	33.0	TA06_25	~~20.5~~ KC
Salinity (ppth):	20.5	TA06_25	KC

Food:	Batch
[ ] YCT	
[ ] *P. subcapitata*	
[8] Artemia Lot # 23613	Artemia Batch:

Chamber size: 400 mL

Test volume: 350 mL per replicate

Artemia Batch:	
0 hr:	1-11
24 hr:	2-11
48 hr:	3-11
72 hr:	4-11

Concentrations prepared by: JD

Temperature Range °C:(if used)

Test Incubated in: Incubator # 2 Waterbath # ____ Incubator # 2 min. 26.1 max. 27.1 mean ____

Light Intensity: 50-100 Ft. candles Waterbath # ___ min. ____ max. ____ mean ____

Photoperiod: 16 hours Light / 8 hours dark Room B246 min. 22.8 max. 23.9 mean ____

Feeding: √as needed
[√] Before test
[ ] 0 hr
[√] 24 hr
[√] 48 hr
[√] 72 hr

all species 2 hrs prior to test

mysids daily

all species except *H. azteca* 2 hr prior to renewal

H. azteca 0 hr and 48 hr

Concentration µg/L mg/L g/L	Replicate	Chamber #	Test Hour 0 hr	24 hr	48 hr BR	48 hr AR	72 hr	96 hr
Control	A	J 1	5	5	5	5	5	5
	B	J 2	5	5	5	5	5	5
	C	J 3	5	5	5	5	5	5
	D	J 4	5	5	5	5	5	5
20	A	J 5	5	5	4 1D	4	4	4
	B	J 6	5	5	4 1D	4	3 1D	3
	C	J 7	5	5	4 1D	4	4	4
	D	J 8	5	5	5	5	4 1D	4
30	A	J 9	5	5	3 2D	3	3	1 2D
	B	J 10	5	5	3 2D	3	1 2D	1
	C	J 11	5	5	3 2D	3	3	3
	D	J 12	5	5	5	5	0 5D	—
45	A	J 13	5	5	2 3D	2	0 2D	—
	B	J 14	5	5	3 2D	3	0 3D	—
	C	J 15	5	5	3 2D	3	0 3D	—
	D	J 16	5	5	2 3D	2	1 1D	1
67	A	J 17	5	5	2 3D	2	0 2D	—
	B	J 18	5	5	0 5D	—	—	—
	C	J 19	5	5	1 4D	1	0 1D	—
	D	J 20	5	4D	1 3D	1	0 1D	—
100	A	J 21	5	5	1 4D	1	0 1D	—
	B	J 22	5	5	1 4D	0 1D	—	—
	C	J 23	5	5	0 5D	—	—	—
	D	J 24	5	5	0 5D	—	—	—
Organisms loaded by: JD		Checked by:	JD	JD	JD	JD	JD	MF

H. azteca		
0 hr	Alk	Hrd
Well		
100%		
96 hr	Alk	Hrd
Well		
100%		

Loading Verified by: KC AR = after renewal

m = missing d = dead BR = before renewal hr = hour

Investigators' Signatures

Marbell Faridath

Kala Clay

Jana Sands

Amelia Markin

Reviewer: Liz Miller

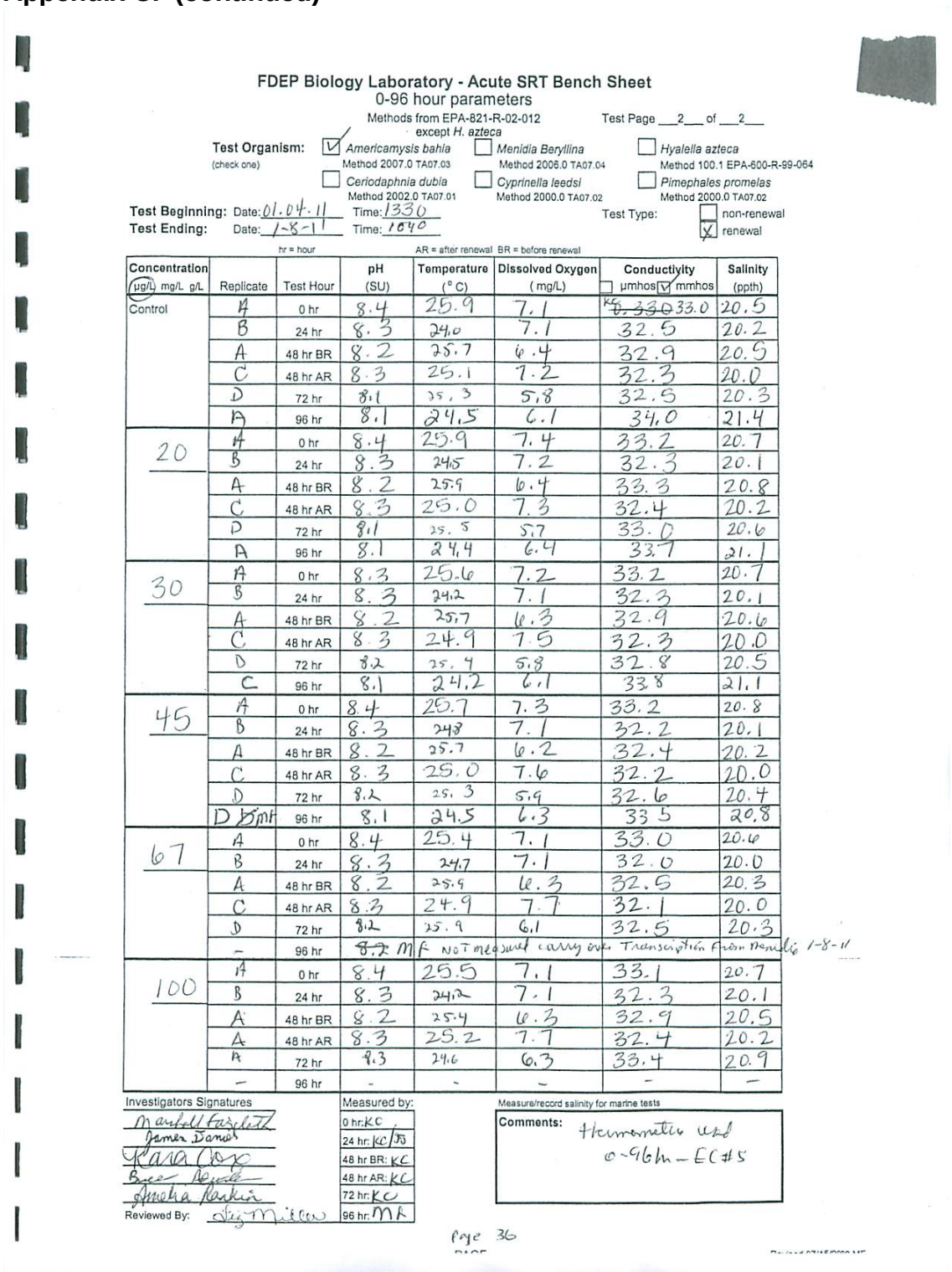
Comments:

Method: TSK

Statistics: LC50	95% confidence intervals Lower	Upper
48 hour: 42.07	34.38	51.48
96 hour: 24.29	21.92	27.37

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Appendix C. (continued)



FDEP Biology Laboratory - Acute SRT Bench Sheet
0-96 hour parameters

Methods from EPA-821-R-02-012 except *H. azteca*
Test Page 2 of 2

Test Organism: (check one)
- ☑ *Americamysis bahia* Method 2007.0 TA07.03
- ☐ *Menidia Beryllina* Method 2006.0 TA07.04
- ☐ *Hyalella azteca* Method 100.1 EPA-600-R-99-064
- ☐ *Ceriodaphnia dubia* Method 2002.0 TA07.01
- ☐ *Cyprinella leedsi* Method 2000.0 TA07.02
- ☐ *Pimephales promelas* Method 2000.0 TA07.02

Test Beginning: Date: 01.04.11 Time: 1330
Test Ending: Date: 1-8-11 Time: 1040
Test Type: ☐ non-renewal ☒ renewal

hr = hour AR = after renewal BR = before renewal

Concentration (µg/L) mg/L g/L	Replicate	Test Hour	pH (SU)	Temperature (° C)	Dissolved Oxygen (mg/L)	Conductivity ☐ µmhos ☑ mmhos	Salinity (ppth)
Control	A	0 hr	8.4	25.9	7.1	~~0.330~~ 33.0	20.5
	B	24 hr	8.3	24.0	7.1	32.5	20.2
	A	48 hr BR	8.2	25.7	6.4	32.9	20.5
	C	48 hr AR	8.3	25.1	7.2	32.3	20.0
	D	72 hr	8.1	25.3	5.8	32.5	20.3
	A	96 hr	8.1	24.5	6.1	34.0	21.4
20	A	0 hr	8.4	25.9	7.4	33.2	20.7
	B	24 hr	8.3	24.5	7.2	32.3	20.1
	A	48 hr BR	8.2	25.9	6.4	33.3	20.8
	C	48 hr AR	8.3	25.0	7.3	32.4	20.2
	D	72 hr	8.1	25.5	5.7	33.0	20.6
	A	96 hr	8.1	24.4	6.4	33.7	21.1
30	A	0 hr	8.3	25.6	7.2	33.2	20.7
	B	24 hr	8.3	24.2	7.1	32.3	20.1
	A	48 hr BR	8.2	25.7	6.3	32.9	20.6
	C	48 hr AR	8.3	24.9	7.5	32.3	20.0
	D	72 hr	8.2	25.4	5.8	32.8	20.5
	C	96 hr	8.1	24.2	6.1	33.8	21.1
45	A	0 hr	8.4	25.7	7.3	33.2	20.8
	B	24 hr	8.3	24.8	7.1	32.2	20.1
	A	48 hr BR	8.2	25.7	6.2	32.4	20.2
	C	48 hr AR	8.3	25.0	7.6	32.2	20.0
	D	72 hr	8.2	25.3	5.9	32.6	20.4
	D DMF	96 hr	8.1	24.5	6.3	33.5	20.8
67	A	0 hr	8.4	25.4	7.1	33.0	20.6
	B	24 hr	8.3	24.7	7.1	32.0	20.0
	A	48 hr BR	8.2	25.9	6.3	32.5	20.3
	C	48 hr AR	8.3	24.9	7.7	32.1	20.0
	D	72 hr	8.2	25.9	6.1	32.5	20.3
	–	96 hr	~~8.2~~ MF NOT measured carry over. Transcription from Manilla 1-8-11				
100	A	0 hr	8.4	25.5	7.1	33.1	20.7
	B	24 hr	8.3	24.2	7.1	32.3	20.1
	A	48 hr BR	8.2	25.4	6.3	32.9	20.5
	A	48 hr AR	8.3	25.2	7.7	32.4	20.2
	A	72 hr	8.3	24.6	6.3	33.4	20.9
	–	96 hr	-	-	-	-	–

Investigators Signatures
Marshall Fazlett
James Daniel
Kara Cox
Brian Nash
Amelia Rankin
Reviewed By: Jay Miller

Measured by:
0 hr: KC
24 hr: KC/JD
48 hr BR: KC
48 hr AR: KC
72 hr: KC
96 hr: MA

Measure/record salinity for marine tests

Comments: Hermometer used @ ~96hr - EC#5

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Appendix C. (continued)

FDEP Biology Laboratory - Acute SRT Bench Sheet

Method from EPA-821-R-02-012 except *H. azteca*

Test Organism: (check one)
☐ *Americamysis bahia* Method 2007.0 TA07.03 ☒ *Menidia Beryllina* Method 2006.0 TA07.04 ☐ *Hyalella azteca* Method 100.1 EPA-600-R-99-064
☐ *Ceriodaphnia dubia* Method 2002.0 TA07.01 ☐ *Cyprinella leedsi* Method 2000.0 TA07.02 ☐ *Pimephales promelas* Method 2000.0 TA07.02

Test Type: ☐ non-renewal ☑ renewal
Test Page 1 of 2

Diluent/ Batch #: ASW 101.05.11 **Organism Batch:** 1411 **Test Beginning:** Date: 01.04.11 Time: 1320
Toxicant/ Batch#: $CuCl_2$ 11.4.11 Age: 14 days **Test Ending:** Date: 1-8-11 Time: 1155

Water Quality Parameters:	Diluent	SOP	Initials
Total Residual Cl_2 (mg/L):	20.03	TA06_22	AGR
Alkalinity (mg/L as $CaCO_3$):	200	TA06_08	KC
Hardness (mg.L as $CaCO_3$):	—	TA06_09	—
Total Ammonia (mg/L as N):	20.07	TA06_17	MF
Conductivity: µmhos (mmhos)	33.1	TA06_25	KC
Salinity (ppth):	20.5	TA06_25	KC

Food:	Batch
☐ YCT	
☐ *P. subcapitata*	
☒ Artemia Lot # 23613	Artemia Batch:

Chamber size: 1000 mL
Test volume: 400 mL per replicate

Artemia Batch:
0 hr: 1-11
24 hr:
48 hr: 3-11
72 hr:

Concentrations prepared by: JD
Test Incubated in: Incubator # 2 Waterbath # ____
Light Intensity: 50-100 Ft. candles
Photoperiod: 16 hours Light / 8 hours dark
Temperature Range °C:(if used)
Incubator # 2 min. 26.1 max. 27.1 mean
Waterbath # ___ min. ___ max. ___ mean ___
Room B246 min. 22.8 max. 23.4 mean

Feeding: √as needed	
☒	Before test
☐	0 hr
☐	24 hr
☒	48 hr
☐	72 hr

all species 2 hrs prior to test
mysids daily
all species except *H. azteca* 2 hr prior to renewal
H. azteca 0 hr and 48 hr

H. azteca		
0 hr	Alk	Hrd
Well		
100%		
96 hr	Alk	Hrd
Well		
100%		

Concentration µg/L mg/L g/L	Replicate	Chamber #	Test Hour 0 hr	24 hr	48 hr BR	48 hr AR	72 hr	96 hr
Control	A	A13	10	10	10	10	10	10
	B	A14	10	10	10	10	10	10
100	A	A15	10	10	10	10	10	10
	B	A16	10	10	10	10	10	10
200	A	A17	10	8 2B	8	8	8	8
	B	A18	10	7 3D	7	7	7	7
300	A	A19	10	6 4D	6	6	6	6
	B	A20	10	7 3D	7	7	7	7
400	A	A21	10	6 1D	1 3D	1	1	1
	B	A22	10	6 1D	1 3D	1	1	1
500	A	A23	10	0 1ND	—	—	—	—
	B	A24	10	0 1ND	—	—	—	—
Organisms loaded by: JD		Checked by:	JD	JD	JD	JD	JD	MF
Loading Verified by: KC								

AR = after renewal
m = missing d = dead BR = before renewal hr = hour

Investigators' Signatures
Marshall Faircloth
Kayla Carr
James Davis
Paige Doyle
Amelia Parker
Reviewer: Liz Miller

Comments:

Method: TSK

Statistics: LC50	95% confidence intervals Lower	Upper
48 hour:	274.39	239.98	313.73
96 hour:	274.39	239.98	313.73

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Appendix C. (continued)

FDEP Biology Laboratory - Acute SRT Bench Sheet
0-96 hour parameters

Methods from EPA-821-R-02-012 except *H. azteca*

Test Page 2 of 2

Test Organism: (check one)
- ☐ *Americamysis bahia* Method 2007.0 TA07.03
- ☒ *Menidia Beryllina* Method 2006.0 TA07.04
- ☐ *Hyalella azteca* Method 100.1 EPA-600-R-99-064
- ☐ *Ceriodaphnia dubia* Method 2002.0 TA07.01
- ☐ *Cyprinella leedsi* Method 2000.0 TA07.02
- ☐ *Pimephales promelas* Method 2000.0 TA07.02

Test Beginning: Date: 01.04.11 Time: 1320
Test Ending: Date: 1-8-11 Time: 1155

Test Type: ☐ non-renewal ☒ renewal

hr = hour AR = after renewal BR = before renewal

Concentration (µg/L) mg/L g/L	Replicate	Test Hour	pH (SU)	Temperature (°C)	Dissolved Oxygen (mg/L)	Conductivity ☐ µmhos ☑ mmhos	Salinity (ppth)
Control	A	0 hr	8.4	25.7	6.9	33.1	20.5
	B	24 hr	8.2	25.5	6.4	32.6	20.0
	A	48 hr BR	8.2	24.6	6.6	33.2	20.3
	A	48 hr AR	8.3	24.4	7.7	32.0	19.8
	B	72 hr	8.1	25.0	6.4	32.8	20.3
	A	96 hr	8.2	25.5	6.6	33.7	20.9
100	A	0 hr	8.4	25.7	7.2	33.2	20.7
	B	24 hr	8.2	25.9	6.3	32.5	20.2
	A	48 hr BR	8.2	24.6	6.6	32.9	20.5
	A	48 hr AR	8.2	24.7	7.6	32.3	20.2
	B	72 hr	8.2	25.3	6.4	33.1	20.7
	A	96 hr	8.2	25.6	6.2	33.6	20.9
200	A	0 hr	8.4	25.7	7.3	33.2	20.7
	B	24 hr	8.2	25.8	6.3	32.2	20.1
	A	48 hr BR	8.2	24.3	6.7	33.0	20.6
	A	48 hr AR	8.2	24.6	7.6	32.5	20.3
	B	72 hr	8.2	24.8	6.4	33.0	20.6
	A	96 hr	8.2	25.0	6.2	33.5	20.9
300	A	0 hr	8.4	25.6	7.2	33.2	20.7
	B	24 hr	8.2	25.6	6.6	32.6	20.3
	A	48 hr BR	8.2	24.3	6.8	32.9	20.5
	A	48 hr AR	8.2	24.6	7.7	32.4	20.2
	B	72 hr	8.2	24.8	6.4	33.2	20.7
	A	96 hr	8.2	24.9	6.2	33.5	20.9
400	A	0 hr	8.4	25.6	7.2	~~33~~ 32.8	20.5
	B	24 hr	8.2	25.5	6.2	32.1	19.8
	A	48 hr BR	8.2	24.4	6.8	32.7	20.4
	A	48 hr AR	8.3	24.7	7.7	32.4	20.2
	B	72 hr	8.2	25.1	6.5	32.9	20.6
	A	96 hr	8.2	25.1	6.3	33.6	21.0
500	A	0 hr	8.4	25.5	7.3	33.2	20.8
	B	24 hr	8.2	25.8	6.2	32.3	20.1
	-	48 hr BR	-	-	-	-	-
	-	48 hr AR	-	-	-	-	-
	-	72 hr	-	-	-	-	-
	/	96 hr	/	/	-	/	-

Investigators Signatures
Marshall Faircloth
James Daniels
K.A. Clay
Becca Abee
Amelia Rankin
Reviewed By: Stig Miller

Measured by:
0 hr: KC
24 hr: KC/JS
48 hr BR: KC
48 hr AR: KC
72 hr: KC
96 hr: MR

Measure/record salinity for marine tests

Comments: Thermometer used 0.46h - EC#5

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Appendix C. (continued)

***Americamysis bahia* Acute Standard Reference Toxicant Test**

DATE: 1-4-11 DURATION: 48 h TOXICANT: CdCl2
SPECIES: *Americamysis bahia*

RAW DATA: Concentration (ug/L)	Number Exposed	Mortalities
.00	20	0
20.00	20	3
30.00	20	6
45.00	20	10
67.00	20	16
100.00	20	18

SPEARMAN-KARBER TRIM: 15.00%

SPEARMAN-KARBER ESTIMATES: LC50: 42.07
95% LOWER CONFIDENCE: 34.38
95% UPPER CONFIDENCE: 51.48

***Menidia beryllina* Acute Standard Reference Toxicant Test**

DATE: 1-4-11 DURATION: 48 h TOXICANT: CuCl2
SPECIES: *Menidia beryllina*

RAW DATA: Concentration (ug/L)	Number Exposed	Mortalities
.00	20	0
100.00	20	0
200.00	20	5
300.00	20	7
400.00	20	18
500.00	20	20

SPEARMAN-KARBER TRIM: .00%

SPEARMAN-KARBER ESTIMATES: LC50: 274.39
95% LOWER CONFIDENCE: 239.98
95% UPPER CONFIDENCE: 313.73

Appendix D. Test Organism Receipts

MARINCO BIOASSAY LABORATORY
The Aquatic Toxicology Specialists

NELAP Certification # E84191

Shipment Record

State of Florida Aquaculture Certificate Number AQ0668007

Shipping Date: 1/3/11

Ship to: FDEP

P.O. No: _____

Species	Quantity	Age	Brood/Lot Number	Temp. (°C)	pH (S.U.)	Salinity (‰)
Mysidopsis bahia	150 ac	4 days	MS 101230	25	8.0	20
Menidia beryllina	150 ac	13 days	SS 101221	25	8.0	20
						Hardness mg/L
Cyprinella leedsi	150 ac	13 days	CL 101221	25	7.8	80
Pimephales promelas	150 ac	7 days	FM 101227	25	7.8	80
Ceriodaphnia dubia						
Daphnia magna						
YCT						
P. subcapitata						

Packed by: PM

Shipped Via: Fed Ex

Notes: _____

Thank you for your order.

4569 Samuel Street · Sarasota, FL 34233 · Tel: 941-925-3594 · Fax: 941-922-3874 · Web: www.biologylab.com

Appendix D. (continued)

MARINCO BIOASSAY LABORATORY
The Aquatic Toxicology Specialists

NELAP Certification # E84191

Shipment Record

State of Florida Aquaculture Certificate Number AQ0668007

Shipping Date: 1/24/16

Ship to: FDEP

P.O. No: _____

Species	Quantity	Age	Brood/Lot Number	Temp. (°C)	pH (S.U.)	Salinity (‰)
Mysidopsis bahia	100 ac	4 days	MS 110120	25	8.0	20
Menidia beryllina	100 ac	12 days	SS 110112	25	8.0	20
						Hardness mg/L
Cyprinella leedsi						
Pimephales promelas	900	< 24 HRS	FM 110124-0900	25	7.8	80
Ceriodaphnia dubia						
Daphnia magna						
YCT						
P. subcapitata						

Packed by: DM

Shipped Via: Fed Ex

Notes: _____

Thank you for your order.

4569 Samuel Street · Sarasota, FL 34233 · Tel: 941-925-3594 · Fax: 941-922-3874 · Web: www.biologylab.com

Appendix E. Chemical Analyses performed on the effluent from the Village of Tequesta WTP Outfall D-001, sampled on January 24, 2011.

Date Sampled	Field ID	Analysis Group	Components	Result	Remark	Units	MDL	PQL
1/24/2011 10:50	Effluent	AGP/LN	Algal Growth Potential	3	AU	mg DryWt/L	3	3
1/24/2011 10:50	Effluent	Chlorophyll/Grain Size/BOD	Chlorophyll-a, Corrected	0.55	U	ug/L	0.55	1.7
1/24/2011 10:50	Effluent	Chlorophyll/Grain Size/BOD	Phaeophytin-a	0.4	U	ug/L	0.4	1.2
1/24/2011 10:50	Effluent	Toxicology	Bioassay-Acute-Screen-SW-Mysid, LC50	100	L	LC50		
1/24/2011 10:50	Effluent	Toxicology	Bioassay-Acute-Screen-SW-Fish, LC50	100	L	LC50		
1/24/2011 10:50	Effluent	Metals	Silver	0.075	U	ug/L	0.075	0.3
1/24/2011 10:50	Effluent	Metals	Cadmium	0.15	U	ug/L	0.15	0.6
1/24/2011 10:50	Effluent	Metals	Calcium	708		mg/L	1.5	6
1/24/2011 10:50	Effluent	Metals	Magnesium	745		mg/L	0.8	3.2
1/24/2011 10:50	Effluent	Metals	Chromium	0.9	U	ug/L	0.9	3.6
1/24/2011 10:50	Effluent	Metals	Lead	0.6	U	ug/L	0.6	2.4
1/24/2011 10:50	Effluent	Metals	Arsenic	1.6	I	ug/L	0.75	3
1/24/2011 10:50	Effluent	Metals	Selenium	0.6	U	ug/L	0.6	2.4
1/24/2011 10:50	Effluent	Metals	Copper	1.5	U	ug/L	1.5	3
1/24/2011 10:50	Effluent	Metals	Zinc	15	U	ug/L	15	60
1/24/2011 10:50	Effluent	Metals	Iron	30	U	ug/L	30	120
1/24/2011 10:50	Effluent	Metals	Aluminum	180	I	ug/L	60	240
1/24/2011 10:50	Effluent	Metals	Nickel	0.75	U	ug/L	0.75	3
1/24/2011 10:50	Effluent	Nutrients	NO2NO3-N	0.94		mg N/L	0.02	0.05
1/24/2011 10:50	Effluent	Nutrients	TSS	8	I	mg/L	4	16
1/24/2011 10:50	Effluent	Nutrients	Fluoride	2.7		mg F/L	0.07	0.2
1/24/2011 10:50	Effluent	Nutrients	Kjeldahl Nitrogen	5.2		mg N/L	0.16	0.4
1/24/2011 10:50	Effluent	Nutrients	Sulfide	0.05	U	mg S/L	0.05	0.2
1/24/2011 10:50	Effluent	Nutrients	Ammonia-N	4.4		mg N/L	0.1	0.2
1/24/2011 10:50	Effluent	Nutrients	Total-P	0.11		mg P/L	0.01	0.1
1/24/2011 10:50	Effluent	Nutrients	O-Phosphate-P	0.029		mg P/L	0.008	0.02
1/24/2011 10:50	Effluent	Overflow	Radium 226	17.8		pCi/L		
1/24/2011 10:50	Effluent	Overflow	Radium 226-Counting Error	0.7		pCi/L		
1/24/2011 10:50	Effluent	Overflow	Radium 228-Counting Error	0.5		pCi/L		
1/24/2011 10:50	Effluent	Overflow	Radium 228	0.8	U	pCi/L		
1/24/2011 10:50	Effluent	Overflow	Alpha, Total	31.6		pCi/L		
1/24/2011 10:50	Effluent	Overflow	Alpha-Counting Error	17.1		pCi/L		
1/24/2011 10:50	Effluent	Pesticides	Ametryn	0.05	U	ug/L	0.05	0.2
1/24/2011 10:50	Effluent	Pesticides	Naled	0.8	U	ug/L	0.8	3.2
1/24/2011 10:50	Effluent	Pesticides	DDD-p,p'	0.02	U	ug/L	0.02	0.08

Appendix E. (continued)

Date Sampled	Field ID	Analysis Group	Components	Result	Remark	Units	MDL	PQL
1/24/2011 10:50	Effluent	Pesticides	DDE-p,p'	0.02	U	ug/L	0.02	0.08
1/24/2011 10:50	Effluent	Pesticides	Endrin Aldehyde	0.02	U	ug/L	0.02	0.08
1/24/2011 10:50	Effluent	Pesticides	Heptachlor	0.01	U	ug/L	0.01	0.04
1/24/2011 10:50	Effluent	Pesticides	Fenamiphos	0.2	U	ug/L	0.2	0.8
1/24/2011 10:50	Effluent	Pesticides	Mevinphos	0.2	U	ug/L	0.2	0.8
1/24/2011 10:50	Effluent	Pesticides	Parathion Ethyl	0.15	U	ug/L	0.15	0.6
1/24/2011 10:50	Effluent	Pesticides	Aldrin	0.01	U	ug/L	0.01	0.04
1/24/2011 10:50	Effluent	Pesticides	Endosulfan I	0.02	U	ug/L	0.02	0.08
1/24/2011 10:50	Effluent	Pesticides	Ethoprop	0.1	U	ug/L	0.1	0.4
1/24/2011 10:50	Effluent	Pesticides	Alpha-BHC	0.01	U	ug/L	0.01	0.04
1/24/2011 10:50	Effluent	Pesticides	Chlordane	0.2	U	ug/L	0.2	0.8
1/24/2011 10:50	Effluent	Pesticides	Endrin	0.05	U	ug/L	0.05	0.2
1/24/2011 10:50	Effluent	Pesticides	Azinphos Methyl	0.2	U	ug/L	0.2	0.8
1/24/2011 10:50	Effluent	Pesticides	Chlorpyrifos Ethyl	0.05	U	ug/L	0.05	0.2
1/24/2011 10:50	Effluent	Pesticides	Hexazinone	0.1	U	ug/L	0.1	0.4
1/24/2011 10:50	Effluent	Pesticides	Phorate	0.05	U	ug/L	0.05	0.2
1/24/2011 10:50	Effluent	Pesticides	Endosulfan Sulfate	0.02	U	ug/L	0.02	0.08
1/24/2011 10:50	Effluent	Pesticides	Heptachlor Epoxide	0.02	U	ug/L	0.02	0.08
1/24/2011 10:50	Effluent	Pesticides	Atrazine	0.05	U	ug/L	0.05	0.2
1/24/2011 10:50	Effluent	Pesticides	Bromacil	0.2	U	ug/L	0.2	0.8
1/24/2011 10:50	Effluent	Pesticides	Fonofos	0.1	U	ug/L	0.1	0.4
1/24/2011 10:50	Effluent	Pesticides	Metolachlor	0.5	U	ug/L	0.5	2
1/24/2011 10:50	Effluent	Pesticides	Prometryn	0.15	U	ug/L	0.15	0.6
1/24/2011 10:50	Effluent	Pesticides	Simazine	0.05	U	ug/L	0.05	0.2
1/24/2011 10:50	Effluent	Pesticides	Delta-BHC	0.01	U	ug/L	0.01	0.04
1/24/2011 10:50	Effluent	Pesticides	Endosulfan II	0.02	U	ug/L	0.02	0.08
1/24/2011 10:50	Effluent	Pesticides	Alachlor	0.6	U	ug/L	0.6	2.4
1/24/2011 10:50	Effluent	Pesticides	Butylate	0.2	U	ug/L	0.2	0.8
1/24/2011 10:50	Effluent	Pesticides	Chlorpyrifos Methyl	0.1	U	ug/L	0.1	0.4
1/24/2011 10:50	Effluent	Pesticides	Diazinon	0.05	U	ug/L	0.05	0.2
1/24/2011 10:50	Effluent	Pesticides	Metalaxyl	0.25	UJ	ug/L	0.25	1
1/24/2011 10:50	Effluent	Pesticides	Norflurazon	0.15	U	ug/L	0.15	0.6
1/24/2011 10:50	Effluent	Pesticides	Beta-BHC	0.01	U	ug/L	0.01	0.04
1/24/2011 10:50	Effluent	Pesticides	DDT-p,p'	0.03	U	ug/L	0.03	0.12

Appendix E. (continued)

Date Sampled	Field ID	Analysis Group	Components	Result	Remark	Units	MDL	PQL
1/24/2011 10:50	Effluent	Pesticides	Methoxychlor	0.05	U	ug/L	0.05	0.2
1/24/2011 10:50	Effluent	Pesticides	Ethion	0.05	U	ug/L	0.05	0.2
1/24/2011 10:50	Effluent	Pesticides	Malathion	0.15	U	ug/L	0.15	0.6
1/24/2011 10:50	Effluent	Pesticides	Metribuzin	0.1	U	ug/L	0.1	0.4
1/24/2011 10:50	Effluent	Pesticides	Toxaphene	0.75	U	ug/L	0.75	3
1/24/2011 10:50	Effluent	Pesticides	Parathion Methyl	0.1	U	ug/L	0.1	0.4
1/24/2011 10:50	Effluent	Pesticides	Dieldrin	0.02	U	ug/L	0.02	0.08
1/24/2011 10:50	Effluent	Pesticides	Gamma-BHC	0.01	U	ug/L	0.01	0.04
1/24/2011 10:50	Effluent	Priority Organic Pollutants	2,4-Dichlorophenol	0.93	U	ug/L	0.93	3.7
1/24/2011 10:50	Effluent	Priority Organic Pollutants	2-Chlorophenol	0.93	U	ug/L	0.93	3.7
1/24/2011 10:50	Effluent	Priority Organic Pollutants	Phenanthrene	0.19	U	ug/L	0.19	0.75
1/24/2011 10:50	Effluent	Priority Organic Pollutants	N-Nitrosodimethylamine	1.9	U	ug/L	1.9	7.5
1/24/2011 10:50	Effluent	Priority Organic Pollutants	Hexachlorocyclopentadiene	2.8	U	ug/L	2.8	11
1/24/2011 10:50	Effluent	Priority Organic Pollutants	Dimethyl phthalate	9.3	U	ug/L	9.3	37
1/24/2011 10:50	Effluent	Priority Organic Pollutants	Butyl benzyl phthalate	4.7	U	ug/L	4.7	19
1/24/2011 10:50	Effluent	Priority Organic Pollutants	Bis(2-chloroethoxy)methane	0.93	U	ug/L	0.93	3.7
1/24/2011 10:50	Effluent	Priority Organic Pollutants	2-Methyl-4,6-dinitrophenol	2.8	U	ug/L	2.8	11
1/24/2011 10:50	Effluent	Priority Organic Pollutants	3,3'-Dichlorobenzidine	37	UJ	ug/L	37	150
1/24/2011 10:50	Effluent	Priority Organic Pollutants	Acenaphthene	0.19	U	ug/L	0.19	0.75
1/24/2011 10:50	Effluent	Priority Organic Pollutants	Anthracene	0.19	U	ug/L	0.19	0.75
1/24/2011 10:50	Effluent	Priority Organic Pollutants	Fluoranthene	0.19	U	ug/L	0.19	0.75
1/24/2011 10:50	Effluent	Priority Organic Pollutants	Hexachloroethane	2.8	U	ug/L	2.8	11
1/24/2011 10:50	Effluent	Priority Organic Pollutants	Nitrobenzene	1.9	UJ	ug/L	1.9	7.5
1/24/2011 10:50	Effluent	Priority Organic Pollutants	Chrysene	0.19	U	ug/L	0.19	0.75
1/24/2011 10:50	Effluent	Priority Organic Pollutants	Hexachlorobutadiene	2.8	U	ug/L	2.8	11
1/24/2011 10:50	Effluent	Priority Organic Pollutants	N-Nitrosodiphenylamine/ Diphenylamine	2.8	U	ug/L	2.8	11
1/24/2011 10:50	Effluent	Priority Organic Pollutants	Naphthalene	0.19	U	ug/L	0.19	0.75
1/24/2011 10:50	Effluent	Priority Organic Pollutants	4-Bromophenyl phenyl ether	0.93	U	ug/L	0.93	3.7
1/24/2011 10:50	Effluent	Priority Organic Pollutants	4-Chlorophenyl phenyl ether	1.9	U	ug/L	1.9	7.5
1/24/2011 10:50	Effluent	Priority Organic Pollutants	Benzo(a)pyrene	0.19	U	ug/L	0.19	0.75
1/24/2011 10:50	Effluent	Priority Organic Pollutants	Bis(2-chloroisopropyl)ether	2.8	U	ug/L	2.8	11
1/24/2011 10:50	Effluent	Priority Organic Pollutants	Di-n-octyl phthalate	0.93	U	ug/L	0.93	3.7
1/24/2011 10:50	Effluent	Priority Organic Pollutants	Diethyl phthalate	0.93	U	ug/L	0.93	3.7
1/24/2011 10:50	Effluent	Priority Organic Pollutants	Isophorone	0.93	U	ug/L	0.93	3.7

Appendix E. (continued)

Date Sampled	Field ID	Analysis Group	Components	Result	Remark	Units	MDL	PQL
1/24/2011 10:50	Effluent	Priority Organic Pollutants	Phenol	0.93	U	ug/L	0.93	3.7
1/24/2011 10:50	Effluent	Priority Organic Pollutants	1,2,4-Trichlorobenzene	0.93	U	ug/L	0.93	3.7
1/24/2011 10:50	Effluent	Priority Organic Pollutants	2-Nitrophenol	0.93	U	ug/L	0.93	3.7
1/24/2011 10:50	Effluent	Priority Organic Pollutants	4-Chloro-3-methylphenol	0.93	U	ug/L	0.93	3.7
1/24/2011 10:50	Effluent	Priority Organic Pollutants	Indeno(1,2,3-cd)pyrene	0.19	U	ug/L	0.19	0.75
1/24/2011 10:50	Effluent	Priority Organic Pollutants	2-Chloronaphthalene	0.93	U	ug/L	0.93	3.7
1/24/2011 10:50	Effluent	Priority Organic Pollutants	Benzidine	93	UJ	ug/L	93	370
1/24/2011 10:50	Effluent	Priority Organic Pollutants	Benzo(a)anthracene	0.19	U	ug/L	0.19	0.75
1/24/2011 10:50	Effluent	Priority Organic Pollutants	Benzo(g,h,i)perylene	0.19	U	ug/L	0.19	0.75
1/24/2011 10:50	Effluent	Priority Organic Pollutants	Benzo(k)fluoranthene	0.19	U	ug/L	0.19	0.75
1/24/2011 10:50	Effluent	Priority Organic Pollutants	Bis(2-chloroethyl)ether	0.93	U	ug/L	0.93	3.7
1/24/2011 10:50	Effluent	Priority Organic Pollutants	Dibenzo(a,h)anthracene	0.19	U	ug/L	0.19	0.75
1/24/2011 10:50	Effluent	Priority Organic Pollutants	N-Nitrosodi-n-propylamine	1.9	U	ug/L	1.9	7.5
1/24/2011 10:50	Effluent	Priority Organic Pollutants	Pentachlorophenol	2.8	U	ug/L	2.8	11
1/24/2011 10:50	Effluent	Priority Organic Pollutants	2,6-Dinitrotoluene	0.93	U	ug/L	0.93	3.7
1/24/2011 10:50	Effluent	Priority Organic Pollutants	Bis(2-ethylhexyl)phthalate	14	U	ug/L	14	56
1/24/2011 10:50	Effluent	Priority Organic Pollutants	Fluorene	0.19	U	ug/L	0.19	0.75
1/24/2011 10:50	Effluent	Priority Organic Pollutants	Hexachlorobenzene	0.93	U	ug/L	0.93	3.7
1/24/2011 10:50	Effluent	Priority Organic Pollutants	2,4,6-Trichlorophenol	0.93	U	ug/L	0.93	3.7
1/24/2011 10:50	Effluent	Priority Organic Pollutants	2,4-Dimethylphenol	9.3	UJ	ug/L	9.3	37
1/24/2011 10:50	Effluent	Priority Organic Pollutants	2,4-Dinitrophenol	14	U	ug/L	14	56
1/24/2011 10:50	Effluent	Priority Organic Pollutants	2,4-Dinitrotoluene	0.93	U	ug/L	0.93	3.7
1/24/2011 10:50	Effluent	Priority Organic Pollutants	Acenaphthylene	0.19	U	ug/L	0.19	0.75
1/24/2011 10:50	Effluent	Priority Organic Pollutants	Benzo(b)fluoranthene	0.19	U	ug/L	0.19	0.75
1/24/2011 10:50	Effluent	Priority Organic Pollutants	Di-n-butyl phthalate	4.7	U	ug/L	4.7	19
1/24/2011 10:50	Effluent	Priority Organic Pollutants	Pyrene	0.19	U	ug/L	0.19	0.75
1/24/2011 10:50	Effluent	Priority Organic Pollutants	4-Nitrophenol	14	U	ug/L	14	56
1/24/2011 10:50	Effluent	Field Parameter	Specific Conductance	29480		umhos/cm		
1/24/2011 10:50	Effluent	Field Parameter	pH	5.97				
1/24/2011 10:50	Effluent	Field Parameter	Sample Depth	0.01		ft		
1/24/2011 10:50	Effluent	Field Parameter	Temperature	23.25		C		
1/24/2011 11:05	Blank	Metals	Aluminum	60	U	ug/L	60	240
1/24/2011 11:05	Blank	Metals	Zinc	5	U	ug/L	5	20
1/24/2011 11:05	Blank	Metals	Iron	30	U	ug/L	30	120
1/24/2011 11:05	Blank	Metals	Arsenic	0.25	U	ug/L	0.25	1

Appendix E. (continued)

Date Sampled	Field ID	Analysis Group	Components	Result	Remark	Units	MDL	PQL
1/24/2011 11:05	Blank	Metals	Selenium	0.2	U	ug/L	0.2	0.8
1/24/2011 11:05	Blank	Metals	Lead	0.2	U	ug/L	0.2	0.8
1/24/2011 11:05	Blank	Metals	Calcium	0.075	U	mg/L	0.075	0.3
1/24/2011 11:05	Blank	Metals	Copper	0.5	U	ug/L	0.5	1
1/24/2011 11:05	Blank	Metals	Cadmium	0.05	U	ug/L	0.05	0.2
1/24/2011 11:05	Blank	Metals	Magnesium	0.04	U	mg/L	0.04	0.16
1/24/2011 11:05	Blank	Metals	Silver	0.025	U	ug/L	0.025	0.1
1/24/2011 11:05	Blank	Metals	Nickel	0.25	U	ug/L	0.25	1
1/24/2011 11:05	Blank	Metals	Chromium	0.3	U	ug/L	0.3	1.2
1/24/2011 11:05	Blank	Nutrients	Kjeldahl Nitrogen	0.08	U	mg N/L	0.08	0.2
1/24/2011 11:05	Blank	Nutrients	NO2NO3-N	0.004	U	mg N/L	0.004	0.01
1/24/2011 11:05	Blank	Nutrients	O-Phosphate-P	0.004	U	mg P/L	0.004	0.01
1/24/2011 11:05	Blank	Nutrients	Ammonia-N	0.01	U	mg N/L	0.01	0.02
1/24/2011 11:05	Blank	Nutrients	Sulfide	0.05	U	mg S/L	0.05	0.2
1/24/2011 11:05	Blank	Nutrients	Fluoride	0.035	U	mg F/L	0.035	0.1
1/24/2011 11:05	Blank	Nutrients	Total-P	0.004	U	mg P/L	0.004	0.01
1/24/2011 11:05	Blank	Overflow	Alpha-Counting Error	0.3		pCi/L		
1/24/2011 11:05	Blank	Overflow	Radium 228	0.7	U	pCi/L		
1/24/2011 11:05	Blank	Overflow	Alpha, Total	0.5	U	pCi/L		
1/24/2011 11:05	Blank	Overflow	Radium 226-Counting Error	0.1		pCi/L		
1/24/2011 11:05	Blank	Overflow	Radium 228-Counting Error	0.5		pCi/L		
1/24/2011 11:05	Blank	Overflow	Radium 226	0.2	U	pCi/L		
1/24/2011 11:05	Blank	Pesticides	Ametryn	0.048	U	ug/L	0.048	0.19
1/24/2011 11:05	Blank	Pesticides	Parathion Ethyl	0.15	U	ug/L	0.15	0.6
1/24/2011 11:05	Blank	Pesticides	Phorate	0.048	U	ug/L	0.048	0.19
1/24/2011 11:05	Blank	Pesticides	Prometryn	0.15	U	ug/L	0.15	0.6
1/24/2011 11:05	Blank	Pesticides	Alpha-BHC	0.01	U	ug/L	0.01	0.04
1/24/2011 11:05	Blank	Pesticides	Hexazinone	0.097	U	ug/L	0.097	0.39
1/24/2011 11:05	Blank	Pesticides	Simazine	0.048	U	ug/L	0.048	0.19
1/24/2011 11:05	Blank	Pesticides	Endosulfan Sulfate	0.02	U	ug/L	0.02	0.08
1/24/2011 11:05	Blank	Pesticides	Gamma-BHC	0.01	U	ug/L	0.01	0.04
1/24/2011 11:05	Blank	Pesticides	Chlorpyrifos Ethyl	0.048	U	ug/L	0.048	0.19
1/24/2011 11:05	Blank	Pesticides	Ethion	0.048	U	ug/L	0.048	0.19
1/24/2011 11:05	Blank	Pesticides	Endosulfan II	0.02	U	ug/L	0.02	0.08
1/24/2011 11:05	Blank	Pesticides	Methoxychlor	0.05	U	ug/L	0.05	0.2

Appendix E. (continued)

Date Sampled	Field ID	Analysis Group	Components	Result	Remark	Units	MDL	PQL
1/24/2011 11:05	Blank	Pesticides	Alachlor	0.58	U	ug/L	0.58	2.3
1/24/2011 11:05	Blank	Pesticides	Atrazine	0.048	U	ug/L	0.048	0.19
1/24/2011 11:05	Blank	Pesticides	Diazinon	0.048	U	ug/L	0.048	0.19
1/24/2011 11:05	Blank	Pesticides	Parathion Methyl	0.097	U	ug/L	0.097	0.39
1/24/2011 11:05	Blank	Pesticides	Endrin Aldehyde	0.02	U	ug/L	0.02	0.08
1/24/2011 11:05	Blank	Pesticides	Heptachlor Epoxide	0.02	U	ug/L	0.02	0.08
1/24/2011 11:05	Blank	Pesticides	Bromacil	0.19	U	ug/L	0.19	0.76
1/24/2011 11:05	Blank	Pesticides	Chlorpyrifos Methyl	0.097	U	ug/L	0.097	0.39
1/24/2011 11:05	Blank	Pesticides	Malathion	0.15	U	ug/L	0.15	0.6
1/24/2011 11:05	Blank	Pesticides	Metribuzin	0.097	U	ug/L	0.097	0.39
1/24/2011 11:05	Blank	Pesticides	DDE-p,p'	0.02	U	ug/L	0.02	0.08
1/24/2011 11:05	Blank	Pesticides	DDT-p,p'	0.03	U	ug/L	0.03	0.12
1/24/2011 11:05	Blank	Pesticides	Heptachlor	0.01	U	ug/L	0.01	0.04
1/24/2011 11:05	Blank	Pesticides	Azinphos Methyl	0.19	U	ug/L	0.19	0.76
1/24/2011 11:05	Blank	Pesticides	Metalaxyl	0.24	UJ	ug/L	0.24	0.96
1/24/2011 11:05	Blank	Pesticides	Metolachlor	0.48	U	ug/L	0.48	1.9
1/24/2011 11:05	Blank	Pesticides	Naled	0.78	U	ug/L	0.78	3.1
1/24/2011 11:05	Blank	Pesticides	Chlordane	0.2	U	ug/L	0.2	0.8
1/24/2011 11:05	Blank	Pesticides	Delta-BHC	0.01	U	ug/L	0.01	0.04
1/24/2011 11:05	Blank	Pesticides	Dieldrin	0.02	U	ug/L	0.02	0.08
1/24/2011 11:05	Blank	Pesticides	Endosulfan I	0.02	U	ug/L	0.02	0.08
1/24/2011 11:05	Blank	Pesticides	Endrin	0.05	U	ug/L	0.05	0.2
1/24/2011 11:05	Blank	Pesticides	Toxaphene	0.75	U	ug/L	0.75	3
1/24/2011 11:05	Blank	Pesticides	Fenamiphos	0.19	U	ug/L	0.19	0.76
1/24/2011 11:05	Blank	Pesticides	Fonofos	0.097	U	ug/L	0.097	0.39
1/24/2011 11:05	Blank	Pesticides	Norflurazon	0.15	U	ug/L	0.15	0.6
1/24/2011 11:05	Blank	Pesticides	Aldrin	0.01	U	ug/L	0.01	0.04
1/24/2011 11:05	Blank	Pesticides	Butylate	0.19	U	ug/L	0.19	0.76
1/24/2011 11:05	Blank	Pesticides	Ethoprop	0.097	U	ug/L	0.097	0.39
1/24/2011 11:05	Blank	Pesticides	Mevinphos	0.19	U	ug/L	0.19	0.76
1/24/2011 11:05	Blank	Pesticides	Beta-BHC	0.01	U	ug/L	0.01	0.04
1/24/2011 11:05	Blank	Pesticides	DDD-p,p'	0.02	U	ug/L	0.02	0.08
1/24/2011 11:05	Blank	Priority Organic Pollutants	2-Chloronaphthalene	0.95	U	ug/L	0.95	3.8
1/24/2011 11:05	Blank	Priority Organic Pollutants	Fluorene	0.19	U	ug/L	0.19	0.76
1/24/2011 11:05	Blank	Priority Organic Pollutants	Benzo(a)anthracene	0.19	U	ug/L	0.19	0.76
1/24/2011 11:05	Blank	Priority Organic Pollutants	Bis(2-chloroethoxy)methane	0.95	U	ug/L	0.95	3.8

Appendix E. (continued)

Date Sampled	Field ID	Analysis Group	Components	Result	Remark	Units	MDL	PQL
1/24/2011 11:05	Blank	Priority Organic Pollutants	Bis(2-chloroisopropyl)ether	2.9	U	ug/L	2.9	11
1/24/2011 11:05	Blank	Priority Organic Pollutants	N-Nitrosodimethylamine	1.9	U	ug/L	1.9	7.6
1/24/2011 11:05	Blank	Priority Organic Pollutants	Nitrobenzene	1.9	U	ug/L	1.9	7.6
1/24/2011 11:05	Blank	Priority Organic Pollutants	Phenol	0.95	U	ug/L	0.95	3.8
1/24/2011 11:05	Blank	Priority Organic Pollutants	Acenaphthylene	0.19	U	ug/L	0.19	0.76
1/24/2011 11:05	Blank	Priority Organic Pollutants	Acenaphthene	0.19	U	ug/L	0.19	0.76
1/24/2011 11:05	Blank	Priority Organic Pollutants	N-Nitrosodi-n-propylamine	1.9	U	ug/L	1.9	7.6
1/24/2011 11:05	Blank	Priority Organic Pollutants	Hexachloroethane	2.9	U	ug/L	2.9	11
1/24/2011 11:05	Blank	Priority Organic Pollutants	Dibenzo(a,h)anthracene	0.19	U	ug/L	0.19	0.76
1/24/2011 11:05	Blank	Priority Organic Pollutants	Butyl benzyl phthalate	4.8	U	ug/L	4.8	19
1/24/2011 11:05	Blank	Priority Organic Pollutants	Bis(2-chloroethyl)ether	0.95	U	ug/L	0.95	3.8
1/24/2011 11:05	Blank	Priority Organic Pollutants	2,4,6-Trichlorophenol	0.95	U	ug/L	0.95	3.8
1/24/2011 11:05	Blank	Priority Organic Pollutants	2,4-Dichlorophenol	0.95	U	ug/L	0.95	3.8
1/24/2011 11:05	Blank	Priority Organic Pollutants	2-Chlorophenol	0.95	U	ug/L	0.95	3.8
1/24/2011 11:05	Blank	Priority Organic Pollutants	3,3'-Dichlorobenzidine	38	U	ug/L	38	150
1/24/2011 11:05	Blank	Priority Organic Pollutants	Benzo(a)pyrene	0.19	U	ug/L	0.19	0.76
1/24/2011 11:05	Blank	Priority Organic Pollutants	Benzo(k)fluoranthene	0.19	U	ug/L	0.19	0.76
1/24/2011 11:05	Blank	Priority Organic Pollutants	Diethyl phthalate	0.95	U	ug/L	0.95	3.8
1/24/2011 11:05	Blank	Priority Organic Pollutants	Hexachlorobutadiene	2.9	U	ug/L	2.9	11
1/24/2011 11:05	Blank	Priority Organic Pollutants	Isophorone	0.95	U	ug/L	0.95	3.8
1/24/2011 11:05	Blank	Priority Organic Pollutants	4-Chlorophenyl phenyl ether	1.9	U	ug/L	1.9	7.6
1/24/2011 11:05	Blank	Priority Organic Pollutants	Fluoranthene	0.19	U	ug/L	0.19	0.76
1/24/2011 11:05	Blank	Priority Organic Pollutants	2,4-Dinitrophenol	14	U	ug/L	14	57
1/24/2011 11:05	Blank	Priority Organic Pollutants	2,6-Dinitrotoluene	0.95	U	ug/L	0.95	3.8
1/24/2011 11:05	Blank	Priority Organic Pollutants	2-Methyl-4,6-dinitrophenol	2.9	U	ug/L	2.9	11
1/24/2011 11:05	Blank	Priority Organic Pollutants	4-Bromophenyl phenyl ether	0.95	U	ug/L	0.95	3.8
1/24/2011 11:05	Blank	Priority Organic Pollutants	4-Nitrophenol	14	U	ug/L	14	57
1/24/2011 11:05	Blank	Priority Organic Pollutants	Chrysene	0.19	U	ug/L	0.19	0.76
1/24/2011 11:05	Blank	Priority Organic Pollutants	Dimethyl phthalate	9.5	U	ug/L	9.5	38
1/24/2011 11:05	Blank	Priority Organic Pollutants	Indeno(1,2,3-cd)pyrene	0.19	U	ug/L	0.19	0.76
1/24/2011 11:05	Blank	Priority Organic Pollutants	Naphthalene	0.19	U	ug/L	0.19	0.76
1/24/2011 11:05	Blank	Priority Organic Pollutants	1,2,4-Trichlorobenzene	0.95	U	ug/L	0.95	3.8
1/24/2011 11:05	Blank	Priority Organic Pollutants	Anthracene	0.19	U	ug/L	0.19	0.76
1/24/2011 11:05	Blank	Priority Organic Pollutants	N-Nitrosodiphenylamine/ Diphenylamine	2.9	U	ug/L	2.9	11
1/24/2011 11:05	Blank	Priority Organic Pollutants	2,4-Dimethylphenol	9.5	U	ug/L	9.5	38

Appendix E. (continued)

Date Sampled	Field ID	Analysis Group	Components	Result	Remark	Units	MDL	PQL
1/24/2011 11:05	Blank	Priority Organic Pollutants	2,4-Dinitrotoluene	0.95	U	ug/L	0.95	3.8
1/24/2011 11:05	Blank	Priority Organic Pollutants	4-Chloro-3-methylphenol	0.95	U	ug/L	0.95	3.8
1/24/2011 11:05	Blank	Priority Organic Pollutants	Benzidine	95	U	ug/L	95	380
1/24/2011 11:05	Blank	Priority Organic Pollutants	Benzo(b)fluoranthene	0.19	U	ug/L	0.19	0.76
1/24/2011 11:05	Blank	Priority Organic Pollutants	Benzo(g,h,i)perylene	0.19	U	ug/L	0.19	0.76
1/24/2011 11:05	Blank	Priority Organic Pollutants	Bis(2-ethylhexyl)phthalate	14	U	ug/L	14	57
1/24/2011 11:05	Blank	Priority Organic Pollutants	Di-n-butyl phthalate	4.8	U	ug/L	4.8	19
1/24/2011 11:05	Blank	Priority Organic Pollutants	Di-n-octyl phthalate	0.95	U	ug/L	0.95	3.8
1/24/2011 11:05	Blank	Priority Organic Pollutants	Hexachlorobenzene	0.95	U	ug/L	0.95	3.8
1/24/2011 11:05	Blank	Priority Organic Pollutants	Hexachlorocyclopentadiene	2.9	U	ug/L	2.9	11
1/24/2011 11:05	Blank	Priority Organic Pollutants	Pentachlorophenol	2.9	U	ug/L	2.9	11
1/24/2011 11:05	Blank	Priority Organic Pollutants	Phenanthrene	0.19	U	ug/L	0.19	0.76
1/24/2011 11:05	Blank	Priority Organic Pollutants	Pyrene	0.19	U	ug/L	0.19	0.76
1/24/2011 11:05	Blank	Priority Organic Pollutants	2-Nitrophenol	0.95	U	ug/L	0.95	3.8
1/24/2011 11:05	Blank	Field Parameter	Sample Depth	0.01		ft		

Appendix F. Facility Summary, Effluent Limits, and Permit Violations Recorded on Discharge Monitoring Report

State of Florida
Department of Environmental Protection
Facility Introduction & Summary

PART I: Information gathered prior to sampling event	
Prepared By: Danielle Melnick	**Contact Number:** (561) 681-6697
Facility Name (as it appears on permit): Village of Tequesta Water Treatment Plant	**Former Names:**
NPDES Permit Number: FL0168572	**Permit Expiration Date:** September 17, 2011 (Revision issued 2/22/2010 regarding Toxicity)
Physical Address: 901 North Old Dixie Highway Tequesta, Florida 33469	
District: Southeast	**County:** Palm Beach
Function of Facility: Drinking water production for municipality	
Facility Type: Drinking water treatment plant – IW - Minor	**Permitted Capacity (MGD):** 1.3 MGD – Concentrate 3.9 MGD Finished water
Mean Flow for previous 12 months for all EXTERNAL outfalls listed in permit (list date range including months): No flow monitoring required by permit.	
If applicable, Mean Flow for previous 12 months for REUSE outfall(s) (list date range including months): N/A	
Description of type of Discharge: ☒ **Continuous** ☐ **Intermittent** ☐ **Seasonal** ☐ **Rainfall Dependent** ☐ **Other, please specify**	
Description of Sampling Location(s) - actual permit designation of permitted sampling point(s): EFF-01: Meter Box adjacent to US 1 Bridge SWD-01: Edge of mixing zone on west side of US 1 Bridge (1 foot below surface) SWA-04: STORET Station FLA28010717, on south side of Loxahatchee River, west of Alternate A1A	
Description of Permitted Outfall(s): D-001: Reverse Osmosis reject water, located at the US 1 Bridge, west of the Jupiter Inlet.	
Description of Treatment Process (if multiple discharge points, include a detailed map or diagram of facility): D-001 – Reverse Osmosis reject water, Hydrogen Sulfide is removed by the addition of hydrogen peroxide within the concentrate force main.	

Appendix F. (continued)

PART I: Continued

List current Effluent Limits of Outfall(s) to be Sampled: This should include any AO or CO limits the facility may be under (Leave cell blank if not applicable)

			Effluent Limitations				Monitoring Requirements			
Parameter	Units	Max/Min	Annual Average	Monthly Average	Weekly Average	Single Sample	Monitoring Frequency	Sample Type	Monitoring Location Site Number	Notes
Specific Conductance	UMho/cm	Rpt Max					Monthly	Grab	EFF-01	
Salinity	mg/L	Rpt Max					Monthly	Grab	EFF-01	
Nitrogen Ammonia, Total (as N)	mg/L	Rpt Max					Monthly	Grab	EFF-01	
Phosphorus, Total (as P)	mg/L	Rpt Max					Monthly	Grab	EFF-01	
Copper, Total Recoverable	ug/L	Rpt Max					Monthly	Grab	EFF-01	
Fluoride, Total (as F)	mg/L	5.0 Max					Monthly	Grab	EFF-01	
Oxygen, Dissolved		1.5 Min					Monthly	Grab	EFF-01	
Temperature	Degrees F	Rpt Max					Monthly	Grab	EFF-01	
pH	SU	8.5 Max / 6.5 Min					Monthly	Grab	EFF-01	
Hydrogen Sulfide (un-ionized)	mg/L	Rpt Max					Monthly	Grab	EFF-01	
Radium 226 + Radium 228, Total	pci/L	55.4 Max					Quarterly	Grab	EFF-01	
Alpha, Gross Particle Activity	Pci/L	124.7 Max					Quarterly	Grab	EFF-01	
Chlorophyll a	mg/L	Rpt Max					Quarterly	Grab	EFF-01	
Toxicity	LC50					25%	Semi-annual	Composite	EFF-01	
Salinity	mg/L	Rpt Max					Monthly	Grab	SWD-01	
Nitrogen, Ammonia, Total (as N)	mg/L	Rpt Max					Monthly	Grab	SWD-01	
Fluoride, Total	mg/L	Rpt Max					Monthly	Grab	SWD-01	

Appendix F. (continued)

PART I: Continued

List current Effluent Limits of Outfall(s) to be Sampled: This should include any AO or CO limits the facility may be under (Leave cell blank if not applicable)

			Effluent Limitations				Monitoring Requirements			
Parameter	Units	Max/Min	Annual Average	Monthly Average	Weekly Average	Single Sample	Monitoring Frequency	Sample Type	Monitoring Location Site Number	Notes
Nitrogen, Total	mg/L	Rpt Max					Monthly	Grab	SWD-01	
Copper, Total Recoverable	ug/L	Rpt Max					Monthly	Grab	SWD-01	
Temperature	Deg. F	Rpt Max					Monthly	Grab	SWD-01	
Oxygen, Dissolved	mg/L	Rpt Max					Monthly	Grab	SWD-01	
Specific Conductance	UMho/cm	Rpt Max					Monthly	Grab	SWD-01	
pH	SU	8.5 Max / 6.5 Min					Monthly	Grab	SWD-01	
Radium 226 + Radium 228, Total	pci/L	Rpt Max					Quarterly	Grab	SWD-01	
Alpha, Gross Particle Activity	Pci/L	Rpt Max					Quarterly	Grab	SWD-01	
Chlorophyll a	mg/L	Rpt Max					Quarterly	Grab	SWD-01	
Salinity	mg/L	Rpt Max					Monthly	Grab	SWA-04	
Nitrogen, Ammonia, Total (as N)	mg/L	Rpt Max					Monthly	Grab	SWA-04	
Nitrogen, Total	mg/L	Rpt Max					Monthly	Grab	SWA-04	
Oxygen, Dissolved	mg/L	Rpt Max					Monthly	Grab	SWA-04	
Specific Conductance	UMho/cm	Rpt Max					Monthly	Grab	SWA-04	
pH	SU	8.5 Max / 6.5 Min					Monthly	Grab	SWA-04	
Chlorophyll a	mg/L	Rpt Max					Quarterly	Grab	SWA-04	

Appendix F. (continued)

PART I: Continued	
Receiving Waters: Jupiter Inlet	**Classification (indicate whether fresh or marine):** Class III marine
Toxicity Test Requirements (routine and/or additional test language, test species, salinity adjustment, etc.): "The permittee shall conduct multi-concentration mysid shrimp, Mysidopsis bahia, Survival, Growth & Fecundity Test and inland silverside, Menidia beryllina, Laval Survival & Growth Test. Routine tests – 100%, 50%, 30%, 12.5%, and 6.25% effluent, and a control 0% effluent.	
Administrative or Consent Orders (date executed, specific requirements, interim limit dates-if applicable, etc.): None	
Facility Mixing Zone Details (if applicable): 145 feet thermal mixing zone in the receiving waters on either side of the outfall.	

List Permit Violations (DMR data) and plant upsets that occurred at the plant within the last year: None

Date	Parameter and Units	Limit	Result
3/2010	pH (SU)	6.5 Min	6.45
6/2010	pH (SU)	6.5 Min	6.24
8/2010	Fluoride, Total (mg/L)	5.0 Max	5.62

Describe previous FYI and WQBEL study: FYI3 performed in past permit cycle. Screening acute w/ mysid and saltwater fish – LC50 = >100%
Describe previous or current Enforcement Actions (including WLs): WL issued/SFCO executed for failure to report Toxicity results on DMR form. Enforment action closed 3/2010.
Describe any violations or problems noted in previous inspection: A March, 2010 CEI found that 1 discrepancy occurred: the facility exceeded the 5.0 Maximum Fluoride limit at EFF-01 with a result of 5.08. Operational adjustments were made and no enforcement was taken.
Discuss whether DMR trends within previous five years are improving or declining: No trends
Additional Comments (this should include a trend of the Effluent, i.e. if the facility is now Reuse):

PART II: Sampling Event Information	
Date(s) sample collected: January 24, 2011	**Sampler(s):** Terry L. Davis & Dan Krinsky

Appendix F. (continued)

Temperature (Deg C):	**pH (SU):**
Dissolved Oxygen (% saturation):	**Conductivity (umhos/cm):**
Total Residual Chlorine (mg/L):	**Total Residual Chlorine - after Disinfection (mg/L):**
Method of Chlorination:	**Method of De-chlorination:**
Flow During Sample Collection for each outfall(MGD):	
Mean Flow for each outfall for previous 12 months based on sampling date (If samples are taken on more than one day, indicate Mean Flow for each day):	
Describe Discharge during Sampling Event: ☒ **Continuous** ☐ **Intermittent** ☐ **Seasonal** ☐ **Rainfall Dependent** ☒ **Other, please specify – see Additional Comments section above.**	
Describe any conditions, difficulties or abnormal events that occurred during the sample collection and any other additional comments here: Delays due to plant security procedures delayed the placing of samples on ice. It was approximately an hour before samples were iced. Preservation with acids was normal.	

Appendix G. EPA End Sheet

The Bioassay of Village of Tequesta WTP effluent sampled on January 24, 2011. NPDES #FL0168572.

Fill Out This Section For All Surface Water Discharger Inspections(CEI, CSI, CBI, PAI, XSI-RI Optional)

Transaction Code	NPDES NUMBER	YR/MO/DA	Insp Type	Inspector	Fac Type
1 N 2 5	3 F L 0 1 6 8 5 7 2 11	12 1 1 0 1 2 4	18 **B**	19 **S**	20 2

Remarks

66

The Priority Pollutants Analysis of Village of Tequesta WTP effluent sampled on January 24, 2011. NPDES #FL0168572.

Fill Out This Section For All Surface Water Discharger Inspections(CEI, CSI, CBI, PAI, XSI-RI Optional)

Transaction Code	NPDES NUMBER	YR/MO/DA	Insp Type	Inspector	Fac Type
1 N 2 5	3 F L 0 1 6 8 5 7 2 11	12 1 1 0 1 2 4	18 **X**	19 **S**	20 2

Remarks

66

Biological Analyses of Village of Tequesta WTP effluent sampled on January 24, 2011. NPDES #FL0168572.

Fill Out This Section For All Surface Water Discharger Inspections(CEI, CSI, CBI, PAI, XSI-RI Optional)

Transaction Code	NPDES NUMBER	YR/MO/DA	Insp Type	Inspector	Fac Type
1 N 2 5	3 F L 0 1 6 8 5 7 2 11	12 1 1 0 1 2 4	18 **S**	19 **S**	20 2

Remarks

66